

**SEARCH REQUEST FORM****Scientific and Technical Information Center**

Requester's Full Name: DAWN GARRETT Examiner #: 76107 Date: 10/3/03  
 Art Unit: 1994 Phone Number 30 Serial Number: 09/736 519  
 Mail Box and Bldg/Room Location: C23 8032 Results Format Preferred (circle): PAPER DISK E-MAIL

**If more than one search is submitted, please prioritize searches in order of need.**

\*\*\*\*\*  
 Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: ORGANIC ELECTROLUMINESCENCE DEVICE  
 Inventors (please provide full names): YUKIKO MORIOKA, ATSUSHI ODA,  
HITOSHI ISHIKAWA, SATORU TOBUCHI, HIROSHI TADA  
 Earliest Priority Filing Date: DEC. 15, 1999

*\*For Sequence Searches Only\* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.*

Please search claims 1 and 2:

The light-emitting layer requires at least  
2 compounds in mixture.

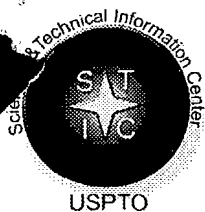
Since these claims are very broad,  
please try searching the diamine of formula (I)  
(see claim 7) with fluorescent materials  
of paragraphs 34-36  
or try searching the specific combinations  
of compounds in the examples (p.26-27)  
(for example Compound # 3 and Compound # 20).

Thank you

Attached is copy of PGPub  
of application

**STAFF USE ONLY**

Searcher: <u>A. Fuller</u>	Type of Search	Vendors and cost where applicable
Searcher Phone #:	NA Sequence (#)	STN <u>✓</u>
Searcher Location:	AA Sequence (#)	Dialog
Date Searcher Picked Up:	Structure (#) <u>6</u>	Questel/Orbit
Date Completed: <u>10/8/03</u>	Bibliographic	Dr. Link
Searcher Prep & Review Time: <u>30</u>	Litigation	Lexis/Nexis
Clerical Prep Time:	Fulltext	Sequence Systems
Online Time: <u>69</u>	Patent Family	WWW/Internet
	Other	Other (specify)



# STIC Search Report

## EIC 1700

STIC Database Tracking Number: 105325

TO: Dawn Garrett  
Location: CP3 8B32  
Art Unit : 1774  
October 8, 2003

Case Serial Number: ~~09/736579~~

09/736519

From: Kathleen Fuller  
Location: EIC 1700  
CP3/4 3D62  
Phone: 308-4290

Kathleen.Fuller@uspto.gov

### Search Notes

I did a structure search covering all the formulas 1-39 for the diamine. The structures were combined with utility and "mixture" to pick up any references which had a mixture of light emitting compounds. Then I did a structure and ring identifier searches to pick up compounds identified on page 20. These were combined with the first structure set and utility.

=> file reg

FILE 'REGISTRY' ENTERED AT 11:04:14 ON 08 OCT 2003  
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Property values tagged with IC are from the ZIC/VINITI data file  
provided by InfoChem.

STRUCTURE FILE UPDATES: 7 OCT 2003 HIGHEST RN 600637-01-2  
DICTIONARY FILE UPDATES: 7 OCT 2003 HIGHEST RN 600637-01-2

TSCA INFORMATION NOW CURRENT THROUGH JULY 14, 2003

Please note that search-term pricing does apply when  
conducting SmartSELECT searches.

Crossover limits have been increased. See HELP CROSSOVER for details.

Experimental and calculated property data are now available. See HELP  
PROPERTIES for more information. See STNote 27, Searching Properties  
in the CAS Registry File, for complete details:  
<http://www.cas.org/ONLINE/STN/STNOTES/stnotes27.pdf>

=> file hcaplus

FILE 'HCAPLUS' ENTERED AT 11:04:18 ON 08 OCT 2003  
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FILE COVERS 1907 - 8 Oct 2003 VOL 139 ISS 15  
FILE LAST UPDATED: 7 Oct 2003 (20031007/ED)

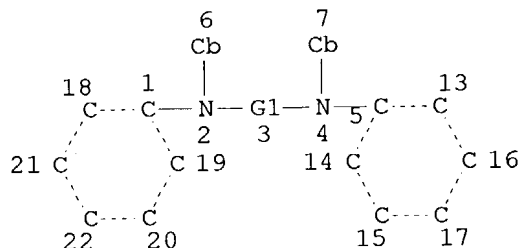
This file contains CAS Registry Numbers for easy and accurate  
substance identification.

=> d que

L1 SCR 1842  
L2 STR

Cb-Cb  
@8 @9

Cb-Cb-Cb  
@10 11 @12



*7412 structures  
from this query  
which covers  
formulas 1 through  
39*

VAR G1=CB/8-2 9-4/10-2 12-4

NODE ATTRIBUTES:

DEFAULT MLEVEL IS ATOM

DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED

NUMBER OF NODES IS 22

STEREO ATTRIBUTES: NONE

L3 SCR 1993

L4 SCR 1610

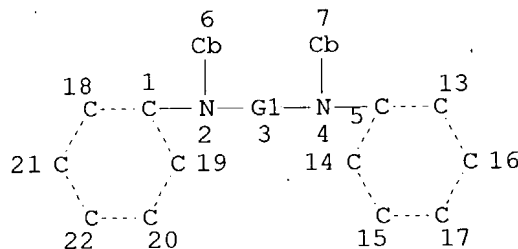
L5 7412 SEA FILE=REGISTRY SSS FUL L2 AND L1 AND L3 AND L4

L6 SCR 1842

L7 STR

Cb-Cb  
@8 @9

Cb-Cb-Cb  
@10 11 @12



VAR G1=CB/8-2 9-4/10-2 12-4

NODE ATTRIBUTES:

DEFAULT MLEVEL IS ATOM

DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED

NUMBER OF NODES IS 22

STEREO ATTRIBUTES: NONE

L8 SCR 1993

L9 SCR 1610

L10 ( 7412)SEA FILE=REGISTRY SSS FUL L7 AND L6 AND L8 AND L9

L11 ( 5810)SEA FILE=HCAPLUS ABB=ON L10

L12 ( 2145)SEA FILE=HCAPLUS ABB=ON L11(L)ELECTROLUMINES?

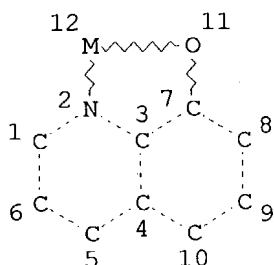
L13 ( 2)SEA FILE=HCAPLUS ABB=ON L12(L)MIXTURE?

L14 ( 7)SEA FILE=HCAPLUS ABB=ON L12 AND MIXTURE?(4A) (EL OR ELECTROLUMI  
NES? OR LIGHT?(3A)?EMIT?)

L15 ( 9)SEA FILE=HCAPLUS ABB=ON L12 AND MIXTURE?(4A) (2 OR TWO)

L16 ( 2927)SEA FILE=HCAPLUS ABB=ON L11(L) (EL OR ?LUMINES? OR LIGHT?(3A)?E

MIT?)  
 L17 ( 10)SEA FILE=HCAPLUS ABB=ON L16 AND MIXTURE?(4A)(2 OR TWO)  
 L18 ( 12)SEA FILE=HCAPLUS ABB=ON L16 AND MIXTURE?(4A)(EL OR ELECTROLUMI  
 NES? OR LIGHT?(3A)?EMIT?)  
 L19 19 SEA FILE=HCAPLUS ABB=ON L13 OR L14 OR L15 OR L17 OR L18  
 L20 STR



8,270 structures from this query  
 covering some compounds  
 on pages 20

NODE ATTRIBUTES:  
 DEFAULT MLEVEL IS ATOM  
 DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:  
 RING(S) ARE ISOLATED OR EMBEDDED  
 NUMBER OF NODES IS 12

STEREO ATTRIBUTES: NONE

L24 31942 SEA FILE=REGISTRY ABB=ON 16.536.5/RID  
 L27 44435 SEA FILE=REGISTRY ABB=ON 16.239.9/RID  
 L28 8270 SEA FILE=REGISTRY SSS FUL L20  
 L29 7427 SEA FILE=REGISTRY ABB=ON L24 AND 4/NR  
 L30 6339 SEA FILE=REGISTRY ABB=ON L27 AND 5/NR  
 L31 5810 SEA FILE=HCAPLUS ABB=ON L5  
 L32 7799 SEA FILE=HCAPLUS ABB=ON L28  
 L33 2526 SEA FILE=HCAPLUS ABB=ON L29  
 L34 2604 SEA FILE=HCAPLUS ABB=ON L30  
 L35 2485 SEA FILE=HCAPLUS ABB=ON L31 AND (L32 OR L33 OR L34)  
 L36 2927 SEA FILE=HCAPLUS ABB=ON L5(L)(EL OR ?LUMINES? OR LIGHT?(3A)?EM  
 IT?)  
 L37 2119 SEA FILE=HCAPLUS ABB=ON L35 AND L36  
 L38 60 SEA FILE=HCAPLUS ABB=ON L37 AND MIXTURE?  
 L39 59 SEA FILE=HCAPLUS ABB=ON L38 AND OPTICAL?/SC,SX  
 L40 59 SEA FILE=HCAPLUS ABB=ON L39 AND (DEVICE? OR DEV/RL)  
 L41 130539 SEA FILE=HCAPLUS ABB=ON MIXTURE?/IT  
 L42 10 SEA FILE=HCAPLUS ABB=ON L40 AND L41  
 L43 41 SEA FILE=HCAPLUS ABB=ON L38 AND ELECTRIC?/SC,SX  
 L44 41 SEA FILE=HCAPLUS ABB=ON L43 AND (DEVICE? OR DEV/RL)  
 L45 8 SEA FILE=HCAPLUS ABB=ON L41 AND L44  
 L46 10 SEA FILE=HCAPLUS ABB=ON L42 OR L45  
 L47 24 SEA FILE=HCAPLUS ABB=ON L19 OR L46

ring identifier for  
  
 ring identifier for

=> d 147 all 1-24 hitstr

L47 ANSWER 1 OF 24 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2003:633202 HCAPLUS  
 DN 139:171128  
 TI Using organic materials in making an organic light-emitting device  
 IN Ghosh, Syamal K.; Carlton, Donn B.; Hatwar, Tukaram K.; Van Slyke, Steven

A.

PA Eastman Kodak Company, USA  
 SO U.S. Pat. Appl. Publ., 23 pp.  
 CODEN: USXXCO  
 DT Patent  
 LA English  
 IC ICM H01L021-00  
 NCL 438029000  
 CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other  
 Related Properties)  
 Section cross-reference(s): 38, 57, 76

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2003153109	A1	20030814	US 2002-73690	20020211
	EP 1337132	A1	20030820	EP 2003-75301	20030131
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
	JP 2003249359	A2	20030905	JP 2003-32322	20030210
	CN 1438826	A	20030827	CN 2003-104404	20030211
PRAI	US 2002-73690	A	20020211		
AB	<p>A method of fabricating an org. layer from an org. material on a substrate which will form part of an org. light-emitting <b>device</b>, is described entailing providing a sublimable org. material in a powder form; providing a thermally conductive and nonsublimable ceramic material in a powder form; forming a <b>mixt.</b> of the sublimable org. material powder and thermally conductive and nonsublimable ceramic material powder; placing such <b>mixt.</b> into a die and using a punch to apply sufficient pressure to the heated <b>mixt.</b> to cause the <b>mixt.</b> of powders to consolidate into a solid pellet; and removing the pellet from the die. A method of fabricating solid pellets of sublimable org. material adaptable for making an org. layer on a substrate which will form part of an org. light-emitting <b>device</b>, is also described entailing (a) providing at least one sublimable org. host material in a powder form; (b) providing at least one sublimable org. dopant material in a powder form and as a selected wt. fraction of the org. host material; (c) forming a first <b>mixt.</b> of the at least one org. host material and the at least one org. dopant material; (d) providing a thermally conductive and non-sublimable ceramic material in a powder form; (e) forming a second <b>mixt.</b> of selected portions of the first <b>mixt.</b> and the thermally conductive and non-sublimable ceramic material powder; (f) placing such <b>mixt.</b> into a die and using a two opposing punches to apply sufficient pressure to the <b>mixt.</b>; (g) applying heat to the die during or prior to applying pressure by the opposing punches to aid in causing the second <b>mixt.</b> of powders to consolidate into a solid pellet; and (h) removing the pellet from the die.</p>				
ST	org layer light emitting <b>device</b> thermally conductive ceramic material				
IT	Electroluminescent <b>devices</b> Semiconductor <b>device</b> fabrication (org. <b>light-emitting device</b> using <b>mixt.</b> of thermally conductive ceramic material and org. material and fabrication method)				
IT	Pellets (org., org. <b>light-emitting device</b> ; org. <b>light-emitting device</b> using <b>mixt.</b> of thermally conductive ceramic material and org. material and				

fabrication method)

IT Materials  
(org.; org. **light-emitting device** using  
**mixt.** of thermally conductive ceramic material and org.  
material and fabrication method)

IT 7440-50-8, Copper, uses **123847-85-8**, .alpha.-NPD  
RL: **DEV (Device component use); USES (Uses)**  
(hole transport material; org. **light-emitting**  
**device** using **mixt.** of thermally conductive ceramic  
material and org. material and fabrication method)

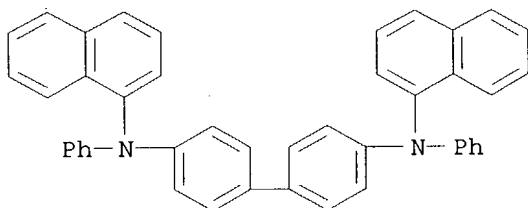
IT **2085-33-8**, AlQ3  
RL: **DEV (Device component use); USES (Uses)**  
(luminescent material; org. **light-emitting**  
**device** using **mixt.** of thermally conductive ceramic  
material and org. material and fabrication method)

IT 12070-08-5, Titanium carbide 12070-12-1, Tungsten carbide 24304-00-5,  
Aluminum nitride(AlN)  
RL: **TEM (Technical or engineered material use); USES (Uses)**  
(thermally conductive ceramic material; org. **light-**  
**emitting device** using **mixt.** of thermally  
conductive ceramic material and org. material and fabrication method)

IT 7429-90-5, Aluminum, uses  
RL: **DEV (Device component use); USES (Uses)**  
(thermally conductive material; org. **light-emitting**  
**device** using **mixt.** of thermally conductive ceramic  
material and org. material and fabrication method)

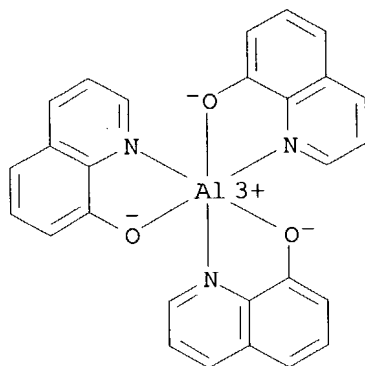
IT **123847-85-8**, .alpha.-NPD  
RL: **DEV (Device component use); USES (Uses)**  
(hole transport material; org. **light-emitting**  
**device** using **mixt.** of thermally conductive ceramic  
material and org. material and fabrication method)

RN 123847-85-8 HCAPLUS  
CN [1,1'-Biphenyl]-4,4'-diamine, N,N'-di-1-naphthalenyl-N,N'-diphenyl- (9CI)  
(CA INDEX NAME)



IT **2085-33-8**, AlQ3  
RL: **DEV (Device component use); USES (Uses)**  
(luminescent material; org. **light-emitting**  
**device** using **mixt.** of thermally conductive ceramic  
material and org. material and fabrication method)

RN **2085-33-8** HCAPLUS  
CN Aluminum, tris(8-quinolinolato-.kappa.N1,.kappa.O8)- (9CI) (CA INDEX  
NAME)



L47 ANSWER 2 OF 24 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2003:397149 HCAPLUS  
 DN 138:409107  
 TI Organic light-emitting **device** having high luminescent efficiency  
 IN Kim, Hae-Won  
 PA Neoview Co., Ltd., S. Korea  
 SO PCT Int. Appl., 21 pp.  
 CODEN: PIXXD2  
 DT Patent  
 LA English  
 IC ICM H05B033-18  
 ICS H05B033-14; H05B033-20  
 CC 73-11 (**Optical**, Electron, and Mass Spectroscopy and Other  
 Related Properties)  
 Section cross-reference(s): 76

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003043383	A1	20030522	WO 2002-KR2021	20021030
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				

PRAI KR 2001-70024 A 20011112

AB A high efficiency org. light-emitting **device** is described comprising a first electrode formed on a substrate; at least one org. light-emitting layer formed on the first electrode; a second electrode formed on the org. layer; and a hole inducing layer including a material having an ionization potential higher than that of the org. light-emitting layer and formed between the first electrode and the org. light-emitting layer and/or an electron blocking layer including a material having an electron affinity higher than that of the org. light-emitting layer and formed between the second electrode and the org. light-emitting layer, wherein the first electrode is made of ITO, the second electrode is made



of Ag, the hole inducing layer includes the **mixt.** of a NPD and TAZ and the org. light-emitting layer is made of Alq3 and wherein the light-emitting **device** may further comprise a hole injecting layer formed on the first electrode and comprising m-MTDATA, a hole transporting layer formed on the hole injecting layer and comprising a NPD.

ST org light emitting **device** hole transporting layer NPD TAZ

IT Electroluminescent **devices**

(org. light-emitting **device** having high luminescent efficiency using NPD/TAZ **mixt.**)

IT 7440-22-4, Silver, uses 7789-24-4, Lithium fluoride (LiF), uses 50926-11-9, Indium tin oxide

RL: **DEV (Device component use); USES (Uses)**

(electrode; org. light-emitting **device** having high luminescent efficiency using NPD/TAZ **mixt.**)

IT 124729-98-2

RL: **DEV (Device component use); USES (Uses)**

(hole injection layer; org. **light-emitting device** having high **luminescent** efficiency using NPD/TAZ **mixt.**)

IT 123847-85-8, NPD

RL: **DEV (Device component use); USES (Uses)**

(hole transporting layer; org. **light-emitting device** having high **luminescent** efficiency using NPD/TAZ **mixt.**)

IT 150405-69-9, TAZ

RL: **DEV (Device component use); USES (Uses)**

(hole/electron transporting layer; org. light-emitting **device** having high luminescent efficiency using NPD/TAZ **mixt.**)

IT 2085-33-8, Alq3

RL: **DEV (Device component use); USES (Uses)**

(light emitting layer; org. light-emitting **device** having high luminescent efficiency using NPD/TAZ **mixt.**)

RE.CNT 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD  
RE

(1) Eastman Kodak; EP 1009041 A2 2000 HCAPLUS

(2) Idemitsu Kosan Co; JP 2000235893 A 2000 HCAPLUS

(3) Nec Corp; JP 2001167886 A 2001 HCAPLUS

(4) Ricoh Co; JP 08-138868 A 1996 HCAPLUS

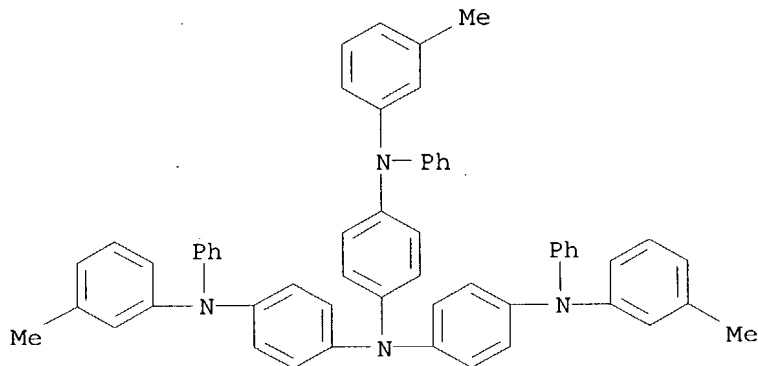
IT 124729-98-2

RL: **DEV (Device component use); USES (Uses)**

(hole injection layer; org. **light-emitting device** having high **luminescent** efficiency using NPD/TAZ **mixt.**)

RN 124729-98-2 HCAPLUS

CN 1,4-Benzenediamine, N-(3-methylphenyl)-N',N'-bis[4-[(3-methylphenyl)phenylamino]phenyl]-N-phenyl- (9CI) (CA INDEX NAME)

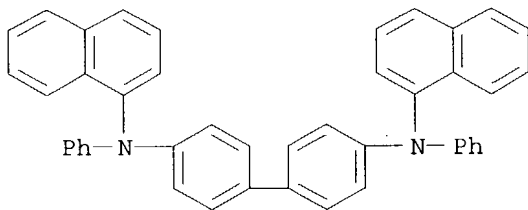


IT 123847-85-8, NPD

RL: **DEV (Device component use);** USES (Uses)  
 (hole transporting layer; org. **light-emitting device** having high **luminescent** efficiency using NPD/TAZ **mixt.**)

RN 123847-85-8 HCAPLUS

CN [1,1'-Biphenyl]-4,4'-diamine, N,N'-di-1-naphthalenyl-N,N'-diphenyl- (9CI)  
 (CA INDEX NAME)

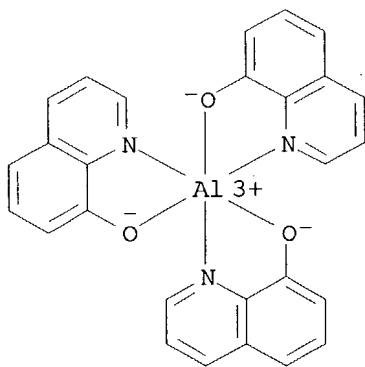


IT 2085-33-8, Alq3

RL: **DEV (Device component use);** USES (Uses)  
 (light emitting layer; org. light-emitting **device** having high luminescent efficiency using NPD/TAZ **mixt.**)

RN 2085-33-8 HCAPLUS

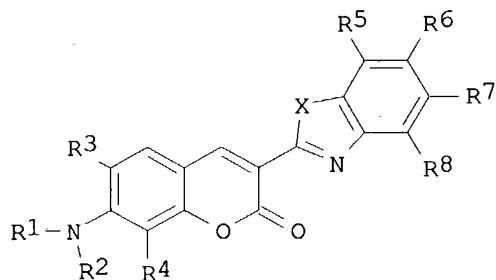
CN Aluminum, tris(8-quinolinolato-.kappa.N1,.kappa.O8)- (9CI) (CA INDEX NAME)



L47 ANSWER 3 OF 24 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2003:373900 HCAPLUS  
 DN 138:376148  
 TI Green organic **light emitting devices**  
 employing a **mixture** of a tertiary aromatic amine, a metal  
 oxinoid, and a green-emitting coumarin dye  
 IN Aziz, Hany; Vong, Cuong; Hu, Nan-Xing; Popovic, Zoran D.; Hor, Ah-Mee  
 PA Xerox Corporation, USA  
 SO Eur. Pat. Appl., 32 pp.  
 CODEN: EPXXDW  
 DT Patent  
 LA English  
 IC ICM H05B033-14  
 ICS H05B033-12; H01L051-20  
 CC 73-11 (**Optical**, Electron, and Mass Spectroscopy and Other  
 Related Properties)  
 Section cross-reference(s): 22, 76

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1311139	A1	20030514	EP 2002-25106	20021108
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, SK				
	US 2003104243	A1	20030605	US 2001-5518	20011108
	JP 2003157980	A2	20030530	JP 2002-324606	20021108
PRAI	US 2001-5518	A	20011108		
OS	MARPAT 138:376148				
GI					



AB Org. light-emitting **devices** are described which comprise a first electrode; a mixed region comprising a **mixt.** of a tertiary arom. amine, a metal oxinoid, and a green-emitting coumarin dye of the formula I, where X is selected from the group consisting of O, S, an alkyl imino group and aryl imino group; R1 and R2 are individually selected from the group consisting of alkyl, aryl, and carbocyclic; R3 and R4 are individually selected from the group consisting of H, alkyl, and optionally a branched or unbranched 5 or 6 member substituent ring connecting with R1 and R2, resp.; and R5-8 are individually selected from the group consisting of H, an alkoxy group and an alkyl group; a second electrode; an optional thermal protective element coated on 1 of the first and second electrodes, where 1 of the electrodes is a hole-injecting anode, and 1 of the electrodes is an electron-injecting cathode, and where

the org. light-emitting **device** further comprises .gtoreq.1 of a hole-transport region interposed or situated between the anode and the mixed region, where the hole-transport region optionally includes a buffer layer; and an electron-transport region interposed between the cathode and the mixed region, and where the green-emitting dye is present in an amt. of .apprxeq.0.01-10 wt. % based on the total of the mixed layer components.

ST green org electroluminescent **device** coumarin dye; OLED tertiary arom amine metal oxinoid green coumarin dye

IT Amines, uses

RL: **DEV (Device component use); USES (Uses)**

(aryl, tertiary; green org. **light emitting devices** employing **mixt.** of tertiary arom. amine, metal oxinoid, and green-emitting coumarin dye)

IT Dyes

(coumarin; green org. **light emitting devices** employing **mixt.** of tertiary arom. amine, metal oxinoid, and green-emitting coumarin dye)

IT Electroluminescent **devices**

(displays; green org. **light emitting devices** employing **mixt.** of tertiary arom. amine, metal oxinoid, and green-emitting coumarin dye)

IT Luminescent screens

(electroluminescent; green org. **light emitting devices** employing **mixt.** of tertiary arom. amine, metal oxinoid, and green-emitting coumarin dye)

IT Electroluminescent **devices**

(green-emitting; green org. **light emitting devices** employing **mixt.** of tertiary arom. amine, metal oxinoid, and green-emitting coumarin dye)

IT Coordination compounds

RL: **DEV (Device component use); USES (Uses)**

(oxinoid; green org. **light emitting devices** employing **mixt.** of tertiary arom. amine, metal oxinoid, and green-emitting coumarin dye)

IT 147-14-8, Copper phthalocyanine

RL: **DEV (Device component use); USES (Uses)**

(buffer layer; green org. **light emitting devices** employing **mixt.** of tertiary arom. amine, metal oxinoid, and green-emitting coumarin dye)

IT 2085-33-8, Tris(8-hydroxyquinoline)aluminum

RL: **DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)**

(electron-transporting layer; green org. **light emitting devices** employing **mixt.** of tertiary arom. amine, metal oxinoid, and green-emitting coumarin dye)

IT 166036-16-4 166036-17-5 266349-83-1

RL: **DEV (Device component use); PRP (Properties); USES (Uses)**

(electron-transporting layer; green org. **light emitting devices** employing **mixt.** of tertiary arom. amine, metal oxinoid, and green-emitting coumarin dye)

IT 134008-76-7

RL: **DEV (Device component use); USES (Uses)**

(green org. **light emitting devices** employing **mixt.** of tertiary arom. amine, metal oxinoid, and green-emitting coumarin dye)

IT 155306-71-1, C 545T

RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)

(green org. **light emitting devices** employing **mixt.** of tertiary arom. amine, metal oxinoid, and green-emitting coumarin dye)

IT 123847-85-8, NPB

RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)

(hole-transporting layer; green org. **light emitting devices** employing **mixt.** of tertiary arom. amine, metal oxinoid, and green-emitting coumarin dye)

IT 7631-86-9, Silica, uses 113443-18-8, Silicon oxide (SiO)

RL: **DEV (Device component use)**; USES (Uses)

(thermal protective layer; green org. **light emitting devices** employing **mixt.** of tertiary arom. amine, metal oxinoid, and green-emitting coumarin dye)

RE.CNT 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD  
RE

- (1) Eastman Kodak Co; EP 0903964 A 1999 HCAPLUS
- (2) Gorsuch, C; US 5925980 A 1999 HCAPLUS
- (3) Kaneko, N; US 5834894 A 1998 HCAPLUS
- (4) Shi, J; APPLIED PHYSICS LETTERS 1997, V70(13), P1665 HCAPLUS
- (5) So, F; US 6114055 A 2000 HCAPLUS
- (6) Univ Princeton; WO 9920081 A 1999 HCAPLUS

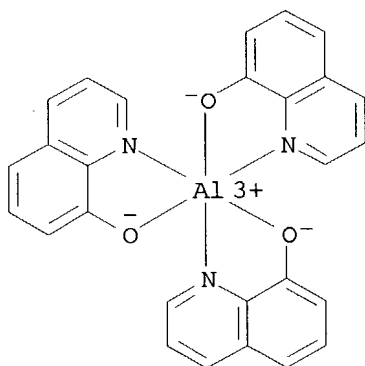
IT 2085-33-8, Tris(8-hydroxyquinoline)aluminum

RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)

(electron-transporting layer; green org. **light emitting devices** employing **mixt.** of tertiary arom. amine, metal oxinoid, and green-emitting coumarin dye)

RN 2085-33-8 HCAPLUS

CN Aluminum, tris(8-quinolinolato-.kappa.N1,.kappa.O8)- (9CI) (CA INDEX NAME)

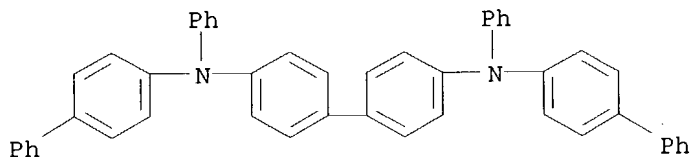


IT 134008-76-7

RL: **DEV (Device component use)**; USES (Uses)

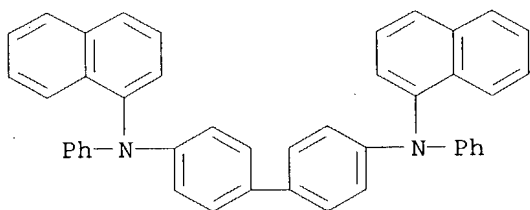
(green org. **light emitting devices** employing **mixt.** of tertiary arom. amine, metal oxinoid, and green-emitting coumarin dye)

RN 134008-76-7 HCAPLUS  
 CN [1,1'-Biphenyl]-4,4'-diamine, N,N'-bis([1,1'-biphenyl]-4-yl)-N,N'-diphenyl-  
 (9CI) (CA INDEX NAME)



IT 123847-85-8, NPB  
 RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)  
 (hole-transporting layer; green org. **light emitting devices** employing **mixt.** of tertiary arom. amine, metal oxinoid, and green-emitting coumarin dye)

RN 123847-85-8 HCAPLUS  
 CN [1,1'-Biphenyl]-4,4'-diamine, N,N'-di-1-naphthalenyl-N,N'-diphenyl- (9CI)  
 (CA INDEX NAME)

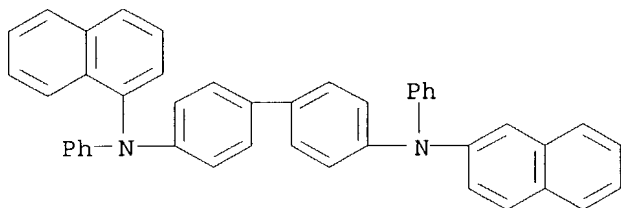


L47 ANSWER 4 OF 24 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2003:118445 HCAPLUS  
 DN 138:178012  
 TI Electroluminescent compositions and devices  
 IN Xie, Shuang  
 PA Can.  
 SO U.S. Pat. Appl. Publ., 49 pp.  
 CODEN: USXXCO  
 DT Patent  
 LA English  
 IC ICM H05B033-12  
 ICS C07C211-00  
 NCL 428690000; 313504000; 313506000; 428704000; 428917000; 564305000;  
 564404000; 564426000; 564427000; 564428000  
 CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)  
 Section cross-reference(s): 25, 76

FAN.CNT 1

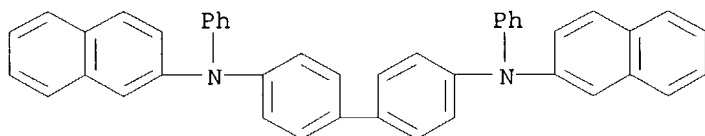
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PI	US 2003031893	A1	20030213	US 2000-736234	20001215
	US 6572985	B2	20030603		
PRAI	US 2000-736234		20001215		

OS MARPAT 138:178012  
AB Mixts. of isomeric arom. amine compds. described by the formula  
[(A1)a+(A2)b+ ... +(An)x] (A1, A2, ... An = individual components of the  
mixt. of isomeric arom. amines) are described in which each amine contains  
.gtoreq.24 carbon atoms and are described by the general formula  
AR1N(Ar2)Ar3 (Ar1 = (un)substituted C.gtoreq.18 aryl group; Ar2 and Ar3 =  
individually selected (un)substituted C.gtoreq.6 aryl group) and each  
individual component in the mixt. has the same mol. formula, the  
difference of each individual component is the sequences of their atoms,  
or the point of attachment of substituents. Electroluminescent devices  
incorporating the mixts. are also described.  
ST arom amine isomeric **mixt electroluminescent** device  
IT Electroluminescent devices  
(arom. amine isomeric mixts. and electroluminescent devices using them)  
IT Amines, uses  
RL: DEV (Device component use); USES (Uses)  
(arom., isomers; arom. amine isomeric mixts. and electroluminescent  
devices using them)  
IT Luminescent substances  
(electroluminescent; arom. amine isomeric mixts. and electroluminescent  
devices using them)  
IT **497182-57-7P 497182-60-2P 497182-62-4P**  
**497182-66-8P**  
RL: DEV (Device component use); SPN (Synthetic preparation); PREP  
(Preparation); USES (Uses)  
(arom. amine isomeric mixts. and **electroluminescent** devices  
using them)  
IT 90-30-2 92-86-4 135-88-6 532-18-3 737-89-3 4316-58-9 4669-06-1  
7511-49-1  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(arom. amine isomeric mixts. and electroluminescent devices using them)  
IT **183064-69-9P 192180-89-5P 197296-70-1P**  
**197296-72-3P 497182-67-9P 497182-68-0P**  
**497182-69-1P 497182-70-4P 497182-71-5P**  
**497182-72-6P 497182-73-7P 497182-74-8P**  
**497182-75-9P 497182-76-0P 497182-77-1P**  
**497182-78-2P 497182-79-3P 497182-84-0P**  
RL: DEV (Device component use); SPN (Synthetic preparation); PREP  
(Preparation); USES (Uses)  
(**mixt. contg.**; arom. amine isomeric mixts. and  
**electroluminescent** devices using them)  
IT **497182-57-7P 497182-60-2P 497182-62-4P**  
**497182-66-8P**  
RL: DEV (Device component use); SPN (Synthetic preparation); PREP  
(Preparation); USES (Uses)  
(arom. amine isomeric mixts. and **electroluminescent** devices  
using them)  
RN 497182-57-7 HCAPLUS  
CN [1,1'-Biphenyl]-4,4'-diamine, N,N'-di-1-naphthalenyl-N,N'-diphenyl-, mixt.  
with N,N'-di-2-naphthalenyl-N,N'-diphenyl[1,1'-biphenyl]-4,4'-diamine and  
N-1-naphthalenyl-N'-2-naphthalenyl-N,N'-diphenyl[1,1'-biphenyl]-4,4'-  
diamine (9CI) (CA INDEX NAME)  
  
CM 1  
  
CRN 212385-77-8  
CMF C44 H32 N2



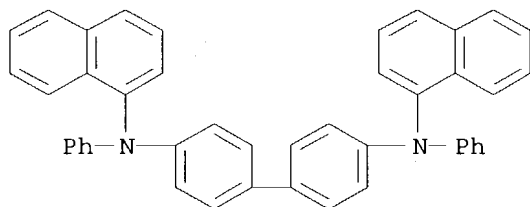
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CRN 139255-17-7  
CMF C44 H32 N2



CM 3

CRN 123847-85-8  
CMF C44 H32 N2



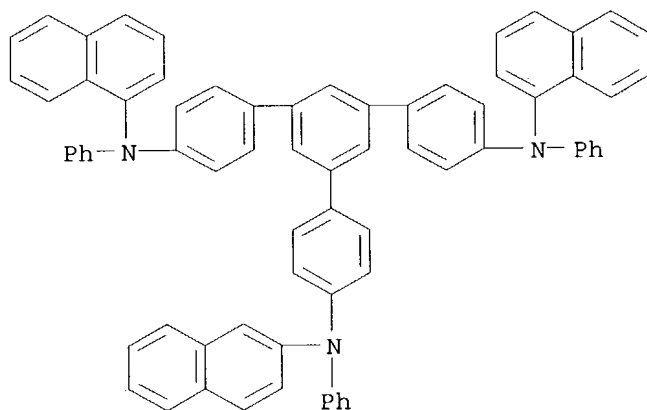
RN 497182-60-2 HCAPLUS

CN [1,1':3',1''-Terphenyl]-4,4''-diamine, N,N'-di-1-naphthalenyl-5'-[4-(1-naphthalenylphenylamino)phenyl]-N,N'-diphenyl-, mixt. with N,N'-di-1-naphthalenyl-5'-[4-(2-naphthalenylphenylamino)phenyl]-N,N'-diphenyl[1,1':3',1''-terphenyl]-4,4''-diamine, N,N'-di-2-naphthalenyl-5'-[4-(1-naphthalenylphenylamino)phenyl]-N,N'-diphenyl[1,1':3',1''-terphenyl]-4,4''-diamine and N,N'-di-2-naphthalenyl-5'-[4-(2-naphthalenylphenylamino)phenyl]-N,N'-diphenyl[1,1':3',1''-terphenyl]-4,4''-diamine (9CI) (CA INDEX NAME)

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CRN 497182-59-9  
CMF C72 H51 N3

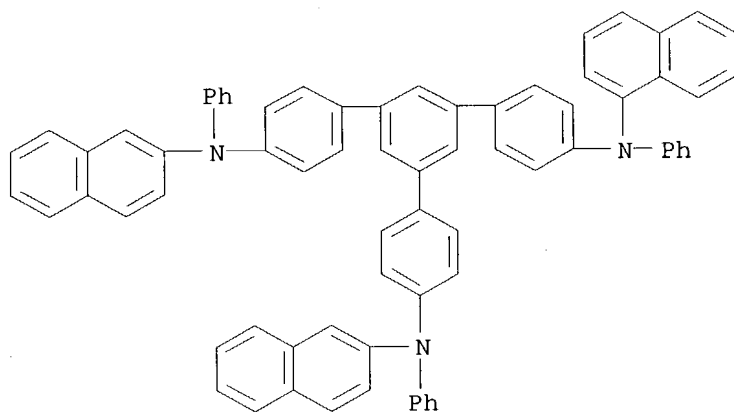




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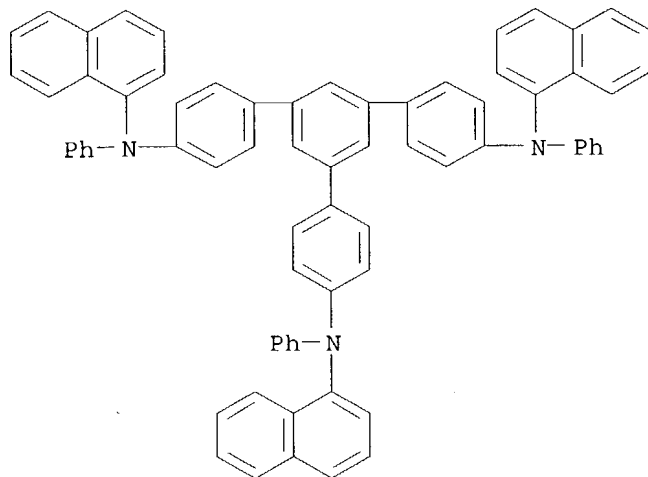
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CM 3

CRN 197296-69-8

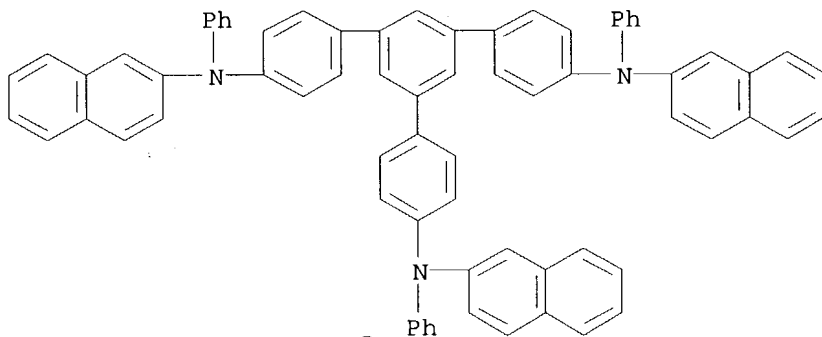
CMF C72 H51 N3



CM 4

CRN 183064-68-8

CMF C72 H51 N3



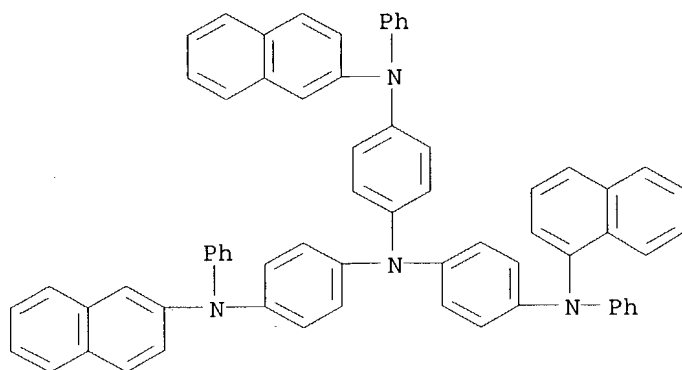
RN 497182-62-4 HCAPLUS

CN 1,4-Benzenediamine, N-1-naphthalenyl-N',N'-bis[4-(1-naphthalenylphenylamino)phenyl]-N-phenyl-, mixt. with N-1-naphthalenyl-N',N'-bis[4-(2-naphthalenylphenylamino)phenyl]-N-phenyl-1,4-benzenediamine, N-2-naphthalenyl-N',N'-bis[4-(1-naphthalenylphenylamino)phenyl]-N-phenyl-1,4-benzenediamine and N-2-naphthalenyl-N',N'-bis[4-(2-naphthalenylphenylamino)phenyl]-N-phenyl-1,4-benzenediamine (9CI) (CA INDEX NAME)

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CRN 497182-61-3

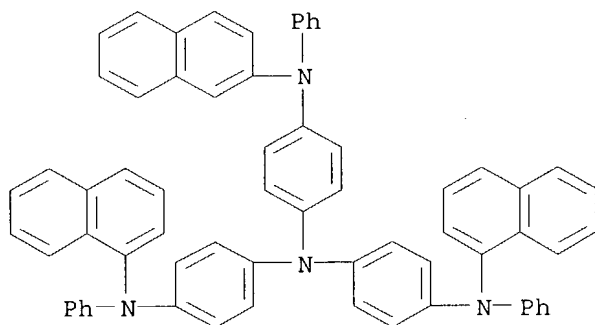
CMF C66 H48 N4



CM 2

CRN 356067-72-6

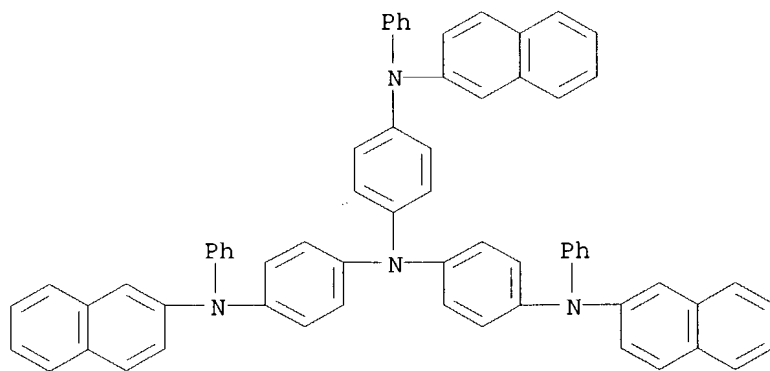
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CM 3

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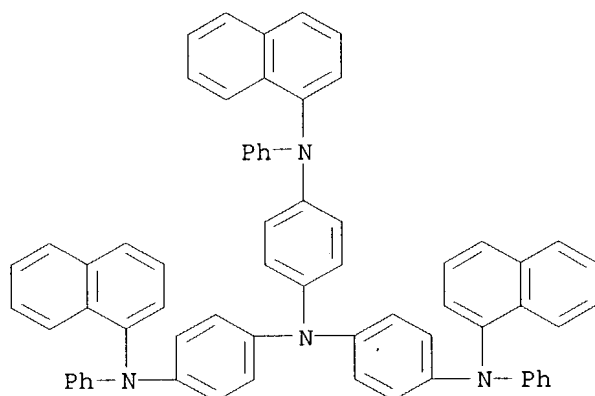
CMF C66 H48 N4



CM 4

CRN 185690-39-5

CMF C66 H48 N4



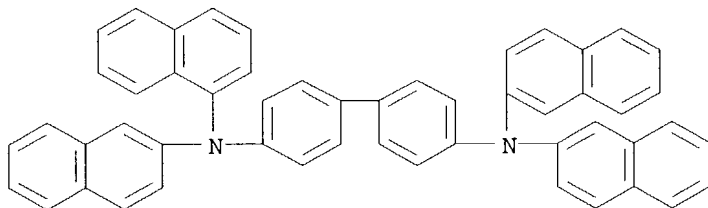
RN 497182-66-8 HCAPLUS

CN [1,1'-Biphenyl]-4,4'-diamine, N,N-di-1-naphthalenyl-N',N'-di-2-naphthalenyl-, mixt. with N,N'-di-1-naphthalenyl-N,N'-di-2-naphthalenyl[1,1'-biphenyl]-4,4'-diamine, N-1-naphthalenyl-N,N',N'-tri-2-naphthalenyl[1,1'-biphenyl]-4,4'-diamine, N,N,N',N'-tetra-1-naphthalenyl[1,1'-biphenyl]-4,4'-diamine, N,N,N',N'-tetra-2-naphthalenyl[1,1'-biphenyl]-4,4'-diamine and N,N,N'-tri-1-naphthalenyl-N'-2-naphthalenyl[1,1'-biphenyl]-4,4'-diamine (9CI) (CA INDEX NAME)

CM 1

CRN 497182-65-7

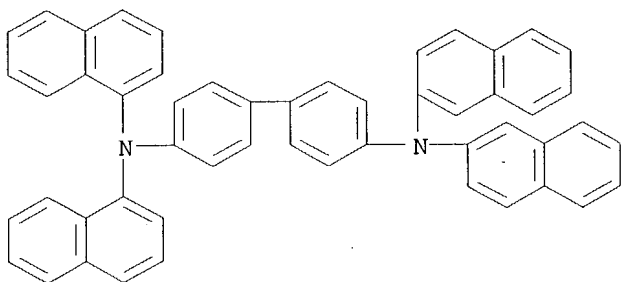
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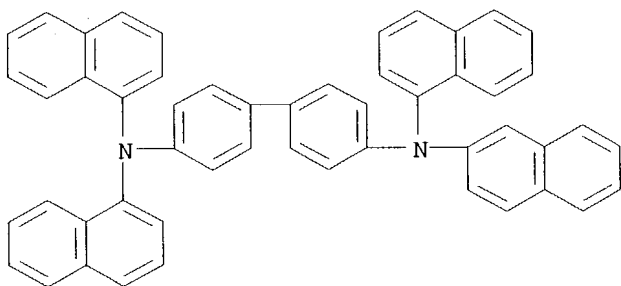
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CMF C52 H36 N2



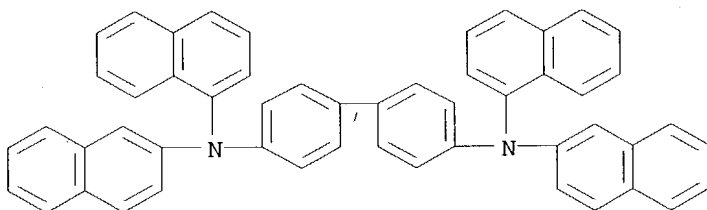
CM 3

CRN 497182-63-5  
CMF C52 H36 N2



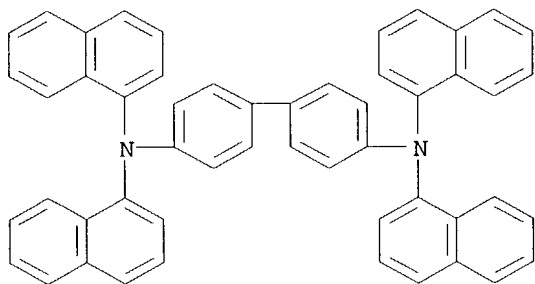
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CRN 374592-88-8  
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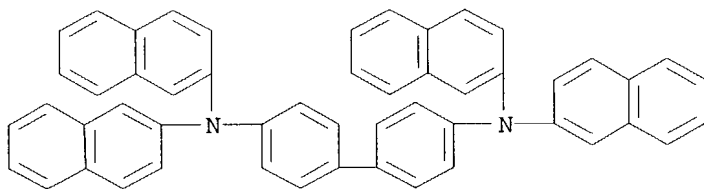
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CM 6

CRN 141752-82-1  
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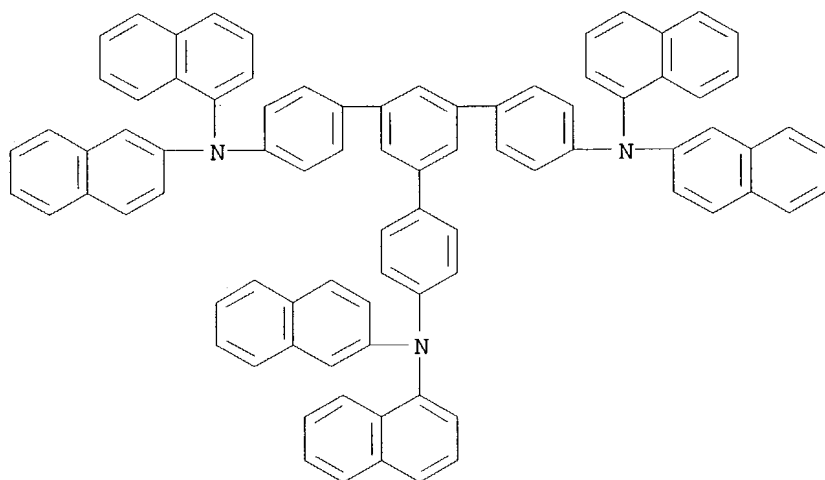
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497182-72-6P 497182-73-7P 497182-74-8P  
497182-75-9P 497182-76-0P 497182-77-1P  
497182-78-2P 497182-79-3P 497182-84-0P

RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)

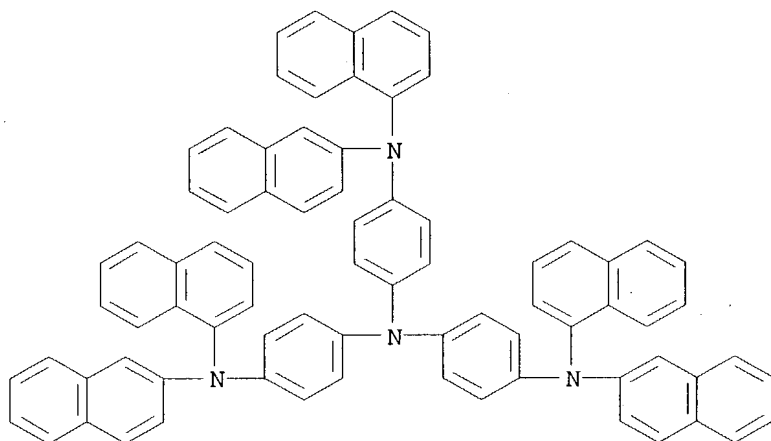
(mixt. contg.; arom. amine isomeric mixts. and electroluminescent devices using them)

RN 183064-69-9 HCAPLUS

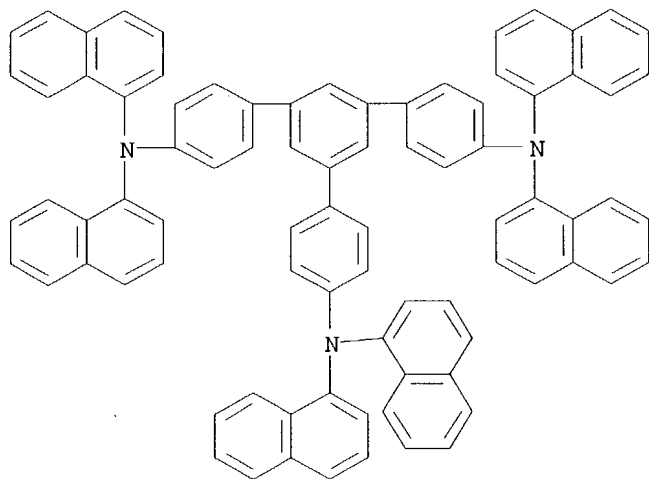
CN [1,1':3',1''-Terphenyl]-4,4''-diamine, N,N'-di-1-naphthalenyl-N,N'-tetra-2-naphthalenyl-5'-[4-(1-naphthalenyl-2-naphthalenylamino)phenyl]- (9CI) (CA INDEX NAME)



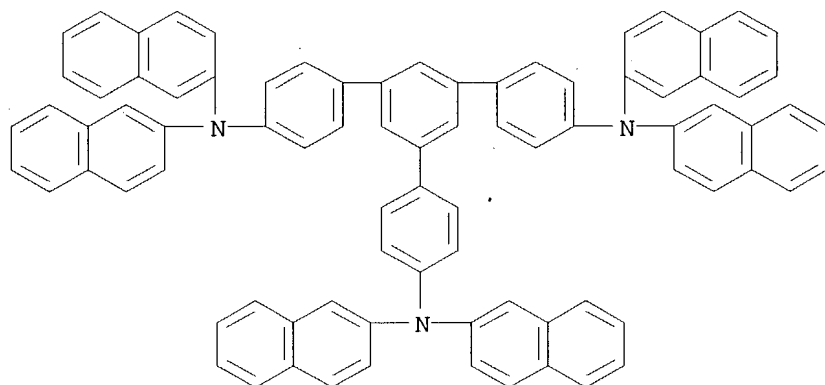
RN 192180-89-5 HCAPLUS  
 CN 1,4-Benzenediamine, N-1-naphthalenyl-N-2-naphthalenyl-N',N'-bis[4-(1-naphthalenyl-2-naphthalenylamino)phenyl]- (9CI) (CA INDEX NAME)



RN 197296-70-1 HCAPLUS  
 CN [1,1':3',1''-Terphenyl]-4,4''-diamine, 5'-[4-(di-1-naphthalenylamino)phenyl]-N,N,N',N'-tetra-1-naphthalenyl- (9CI) (CA INDEX NAME)

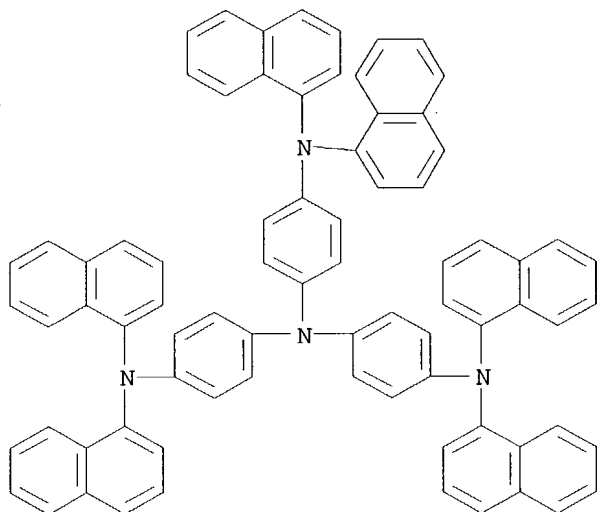


RN 197296-72-3 HCAPLUS  
 CN [1,1':3',1''-Terphenyl]-4,4''-diamine, 5'-[4-(di-2-naphthalenylamino)phenyl]-N,N,N',N'-tetra-2-naphthalenyl- (9CI) (CA INDEX NAME)

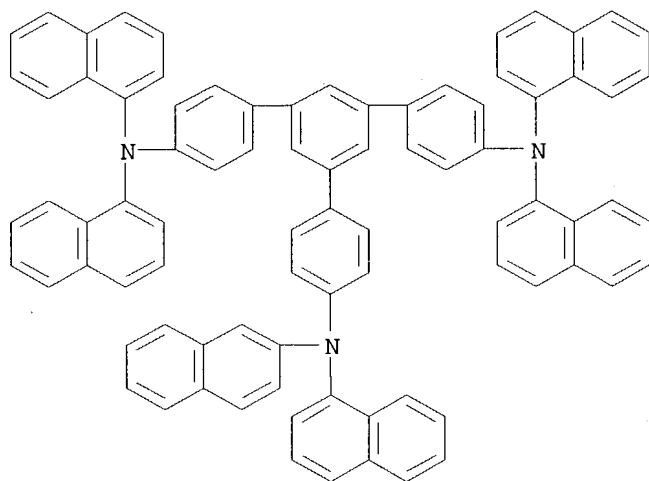


RN 497182-67-9 HCAPLUS  
 CN 1,4-Benzenediamine, N-[1-(di-1-naphthalenylamino)phenyl]-N-[4-(di-1-naphthalenylamino)phenyl]-N',N'-di-1-naphthalenyl- (9CI) (CA INDEX NAME)

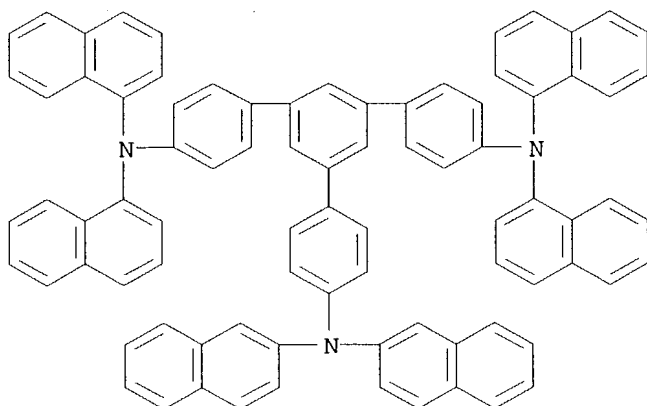




RN 497182-68-0 HCAPLUS  
 CN [1,1':3',1''-Terphenyl]-4,4''-diamine, 5'-[4-(di-1-naphthalenylamino)phenyl]-N,N,N'-tri-1-naphthalenyl-N'-2-naphthalenyl- (9CI) (CA INDEX NAME)

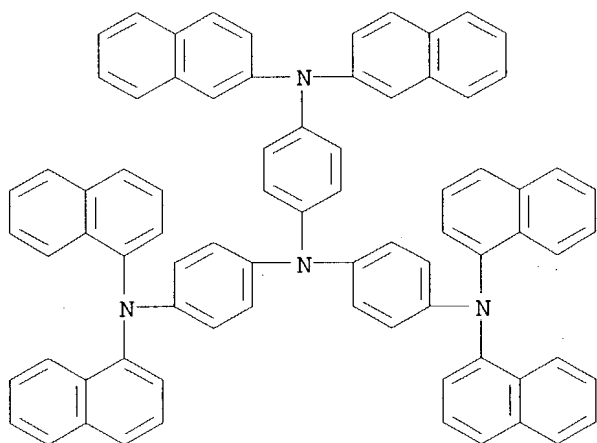


RN 497182-69-1 HCAPLUS  
 CN [1,1':3',1''-Terphenyl]-4,4''-diamine, 5'-[4-(di-1-naphthalenylamino)phenyl]-N,N-di-1-naphthalenyl-N',N'-di-2-naphthalenyl- (9CI) (CA INDEX NAME)



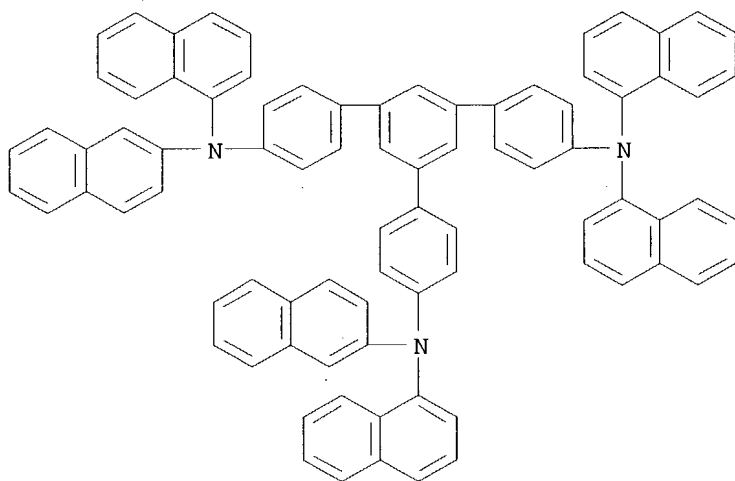
RN 497182-70-4 HCAPLUS

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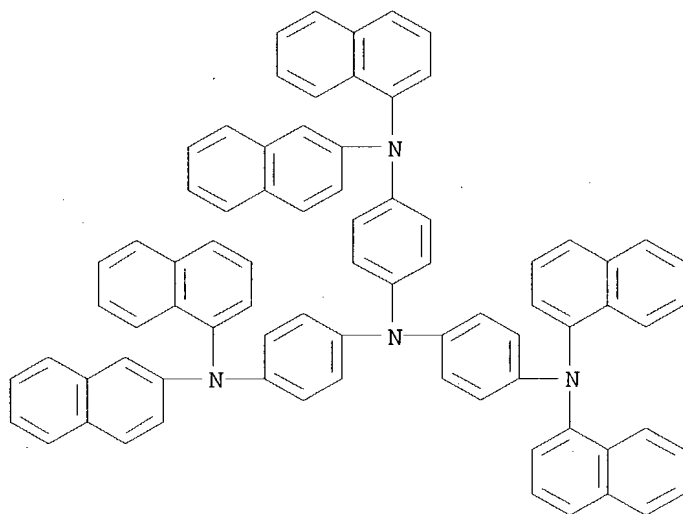


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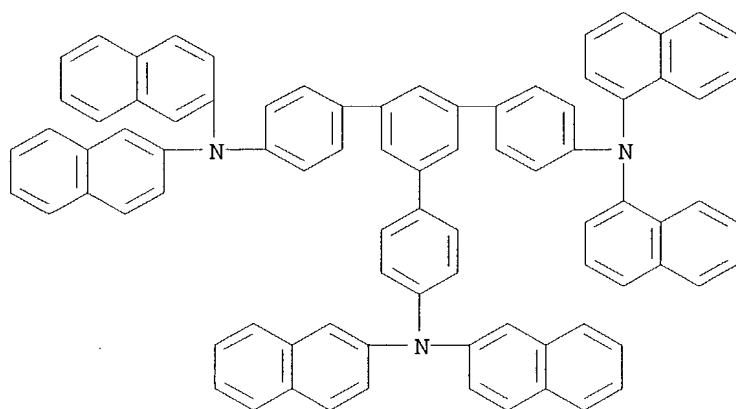
CN [1,1':3',1''-Terphenyl]-4,4''-diamine, 5'-[4-(di-1-naphthalenylamino)phenyl]-N,N'-di-1-naphthalenyl-N,N'-di-2-naphthalenyl- (9CI) (CA INDEX NAME)



RN 497182-72-6 HCAPLUS  
 CN 1,4-Benzenediamine, N-[4-(di-1-naphthalenylamino)phenyl]-N'-1-naphthalenyl-N'-2-naphthalenyl-N-[4-(1-naphthalenyl-2-naphthalenylamino)phenyl]- (9CI)  
 (CA INDEX NAME)

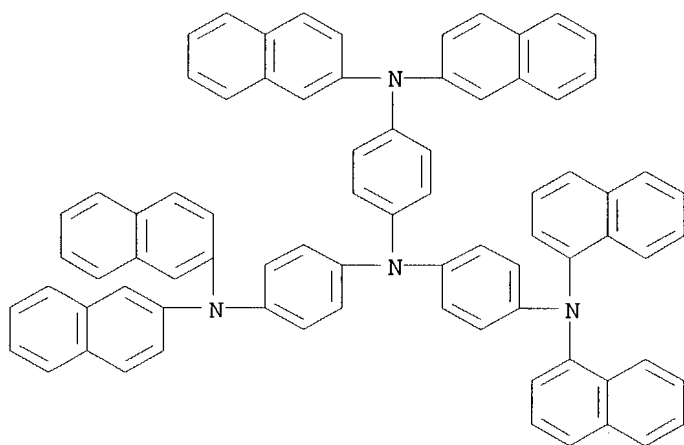


RN 497182-73-7 HCAPLUS  
 CN [1,1':3',1''-Terphenyl]-4,4''-diamine, 5'-[4-(di-2-naphthalenylamino)phenyl]-N,N-di-1-naphthalenyl-N',N'-di-2-naphthalenyl- (9CI)  
 (CA INDEX NAME)



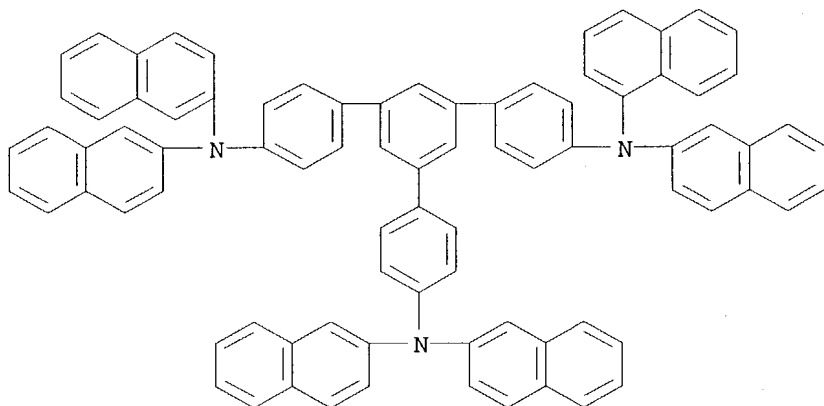
RN 497182-74-8 HCAPLUS

CN 1,4-Benzenediamine, N,N-bis[4-(di-2-naphthalenylamino)phenyl]-N',N'-di-1-naphthalenyl- (9CI) (CA INDEX NAME)



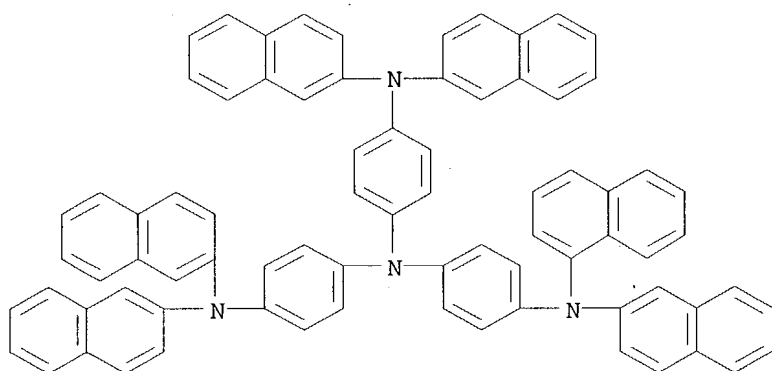
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CN [1,1':3',1''-Terphenyl]-4,4''-diamine, 5'-[4-(di-2-naphthalenylamino)phenyl]-N-1-naphthalenyl-N,N',N'-tri-2-naphthalenyl- (9CI) (CA INDEX NAME)



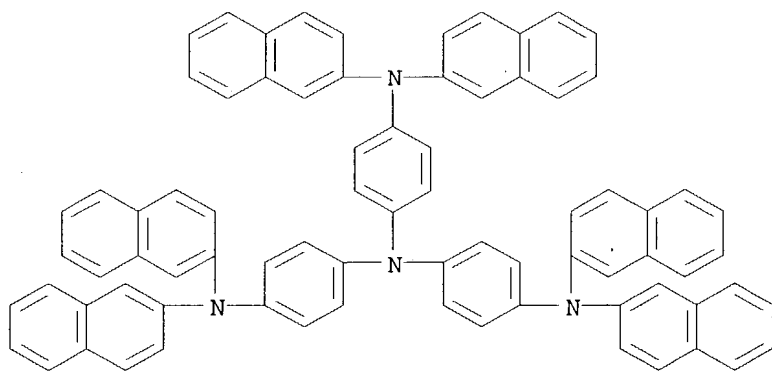
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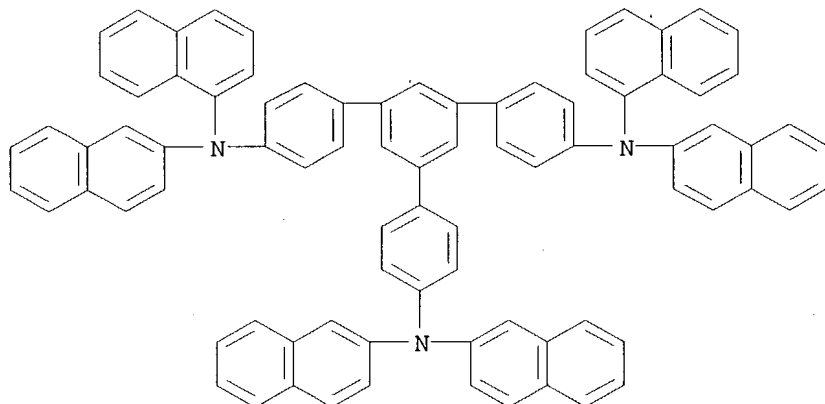
RN 497182-77-1 HCAPLUS

CN 1,4-Benzenediamine, N-[1-(di-2-naphthalenylamino)phenyl]-N-[4-(di-2-naphthalenylamino)phenyl]-N',N'-di-2-naphthalenyl- (9CI) (CA INDEX NAME)

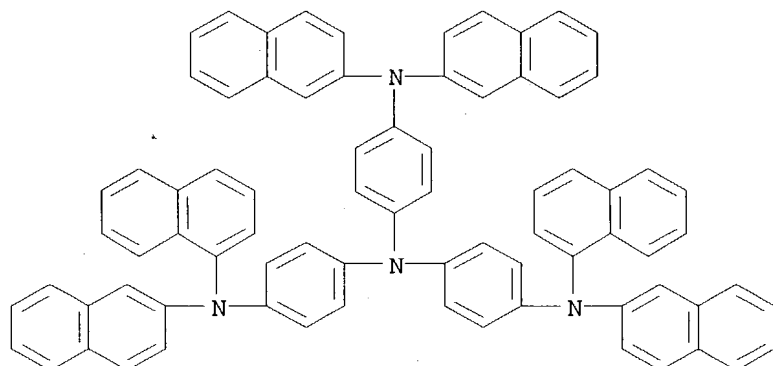


RN 497182-78-2 HCAPLUS

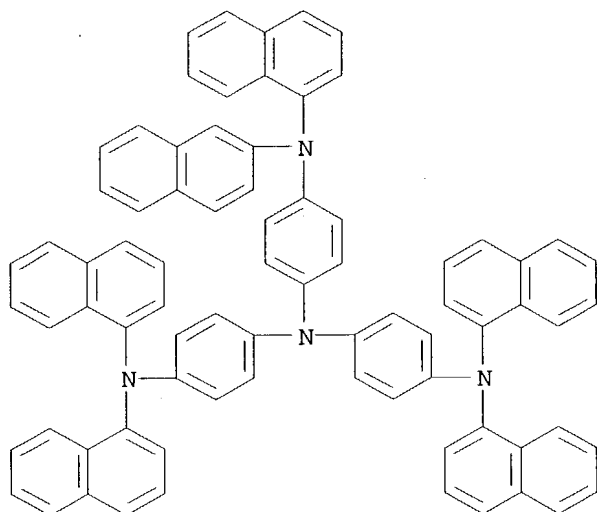
CN [1,1':3',1''-Terphenyl]-4,4''-diamine, 5'-[4-(di-2-naphthalenylamino)phenyl]-N,N'-di-1-naphthalenyl-N,N'-di-2-naphthalenyl- (9CI) (CA INDEX NAME)



RN 497182-79-3 HCAPLUS  
CN 1,4-Benzenediamine, N-[4-(di-2-naphthalenylamino)phenyl]-N'-1-naphthalenyl-N'-2-naphthalenyl-N-[1-(1-naphthalenyl-2-naphthalenylamino)phenyl]- (9CI) (CA INDEX NAME)



RN 497182-84-0 HCAPLUS  
CN 1,4-Benzenediamine, N,N-bis[4-(di-1-naphthalenylamino)phenyl]-N'-1-naphthalenyl-N'-2-naphthalenyl- (9CI) (CA INDEX NAME)



L47 ANSWER 5 OF 24 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2003:92432 HCAPLUS  
 DN 138:144835  
 TI Light-emitting **device** with organic layer doped with  
 photoluminescent material  
 IN Duggal, Anil Raj; Srivastava, Alok Mani; Duclos, Steven Jude  
 PA General Electric Company, USA  
 SO U.S., 13 pp.  
 CODEN: USXXAM  
 DT Patent  
 LA English  
 IC ICM H01L031-072  
 NCL 257184000; 257040000; 257089000; 257098000; 257103000; 313501000;  
 313503000; 313506000; 313507000  
 CC 73-11 (**Optical**, Electron, and Mass Spectroscopy and Other  
 Related Properties)  
 Section cross-reference(s): 22, 38, 76

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 6515314	B1	20030204	US 2000-713394	20001116
	US 2003094626	A1	20030522	US 2002-298202	20021115
PRAI	US 2000-713394	A3	20001116		

AB A light-emitting **device** is described comprising an anode; a cathode; and at least one org. electroluminescent (EL) material disposed between the anode and the cathode, the org. EL material having a plurality of nanoparticles of at least one inorg. photoluminescent (PL) material dispersed therein, the org. EL material being capable of emitting a first electromagnetic (EM) radiation having a first spectrum in response to an elec. voltage applied through the anode and the cathode, and the inorg. PL material being capable of absorbing a portion of the first EM radiation and emitting a second EM radiation having a second spectrum, wherein the org. EL material having the PL nanoparticles dispersed therein is applied on the anode by a method selected from the group consisting of spin coating, spray coating, dip coating, roller coating, and ink-jet printing.

ST light emitting **device** org phosphor

IT Polymers, uses  
 RL: **DEV (Device component use); USES (Uses)**  
 (alkyl fluorene; light-emitting **device** with org. layer doped with phosphor fabricated by using)

IT Metal alkoxides  
 RL: **DEV (Device component use); USES (Uses)**  
 (aluminum, org. light emitting material, alkyl phenoxide; light-emitting **device** with org. layer doped with phosphor fabricated by using)

IT Electroluminescent **devices**  
 (light-emitting **device** with org. layer doped with phosphor)

IT Ink-jet printing  
 (light-emitting **device** with org. layer doped with phosphor fabricated by using)

IT Phenols, uses  
 RL: **DEV (Device component use); USES (Uses)**  
 (metal salts, org. light emitting material; light-emitting **device** with org. layer doped with phosphor fabricated by using)

IT Polysilanes  
 RL: **DEV (Device component use); USES (Uses)**  
 (org. light emitting material; light-emitting **device** with org. layer doped with phosphor fabricated by using)

IT 1312-43-2, Indium oxide 1314-13-2, Zinc oxide, uses 1332-29-2, Tin oxide 50926-11-9, Indium tin oxide 117944-65-7, Indium zinc oxide  
 RL: **DEV (Device component use); USES (Uses)**  
 (anode; light-emitting **device** with org. layer doped with phosphor fabricated by using)

IT 7429-90-5, Aluminum, uses 7439-91-0, Lanthanum, uses 7439-93-2, Lithium, uses 7439-95-4, Magnesium, uses 7440-09-7, Potassium, uses 7440-22-4, Silver, uses 7440-23-5, Sodium, uses 7440-24-6, Strontium, uses 7440-31-5, Tin, uses 7440-39-3, Barium, uses 7440-66-6, Zinc, uses 7440-67-7, Zirconium, uses 7440-70-2, Calcium, uses 7440-74-6, Indium, uses  
 RL: **DEV (Device component use); USES (Uses)**  
 (cathode; light-emitting **device** with org. layer doped with phosphor fabricated by using)

IT 86-73-7D, Fluorene, nitro deriv. 91-19-0D, Quinoxaline, derivs. 91-22-5D, Quinoline, derivs. 844-51-9D, derivs. **2085-33-8**, Tris(8-quinolinolato)aluminum 11120-54-0D, Oxadiazole, derivs.  
 RL: **DEV (Device component use); USES (Uses)**  
 (electron injection material; light-emitting **device** with org. layer doped with phosphor fabricated by using)

IT 128-69-8, 3,4,9,10-Perylenetetra-carboxylic dianhydride 135704-54-0  
 RL: **DEV (Device component use); USES (Uses)**  
 (hole injection material; light-emitting **device** with org. layer doped with phosphor fabricated by using)

IT 25067-59-8, Poly(N-vinylcarbazole)  
 RL: **DEV (Device component use); USES (Uses)**  
 (light-emitting **device** with org. layer doped with phosphor fabricated by using)

IT 91-64-5, Coumarin 106-99-0D, Butadiene, tetra-Ph 120-12-7, Anthracene, uses 191-07-1, Coronene 198-55-0, Perylene 517-51-1, Rubrene 632-51-9 7440-20-2D, Scandium, alkylphenoxide 7440-55-3D, Gallium, alkylphenoxide 7440-74-6D, Indium, alkylphenoxide 13963-57-0, Tris(acetylacetonate)aluminum 14284-94-7, Tris(acetylacetonato)scandium 14405-43-7, Tris(acetylacetonato)gallium 14405-45-9, Tris(acetylacetonato)indium 25190-62-9, Poly(1,4-phenylene) 28802-91-7, Phenylanthracene **153521-90-5**, 1,3,5-Tris[N-(4-



diphenylaminophenyl)phenylamino] benzene

RL: DEV (Device component use); USES (Uses)

(org. light emitting material; light-emitting device with org. layer doped with phosphor fabricated by using)

IT 1309-48-4, Magnesium oxide, uses

RL: DEV (Device component use); USES (Uses)

(phosphor, mixt. of germanium oxide and fluoride; light-emitting device with org. layer doped with phosphor fabricated by using)

IT 1310-53-8, Germanium oxide (GeO<sub>2</sub>), uses

RL: DEV (Device component use); USES (Uses)

(phosphor, mixt. of magnesium oxide and fluoride; light-emitting device with org. layer doped with phosphor fabricated by using)

IT 7783-40-6, Magnesium fluoride

RL: DEV (Device component use); USES (Uses)

(phosphor, mixt. of magnesium oxide and germanium oxide; light-emitting device with org. layer doped with phosphor fabricated by using)

IT 1314-36-9, Yttrium oxide (Y<sub>2</sub>O<sub>3</sub>), uses 7440-27-9, Terbium, uses 7440-45-1, Cerium, uses 11088-40-7, Strontium chloride phosphate (Sr<sub>5</sub>Cl(PO<sub>4</sub>)<sub>3</sub>) 12005-21-9, Aluminum yttrium oxide (Al<sub>5</sub>Y<sub>3</sub>O<sub>12</sub>) 12027-88-2, Yttrium silicate (Y<sub>2</sub>SiO<sub>5</sub>) 13709-90-5, Gadolinium borate (GdBO<sub>3</sub>) 18923-26-7, Cerium(3+), uses 20644-06-8, Magnesium strontium pyrophosphate (MgSrP<sub>2</sub>O<sub>7</sub>) 22541-20-4, Terbium(3+), uses 55070-88-7, Aluminum cerium magnesium oxide (Al<sub>11</sub>CeMgO<sub>19</sub>) 55134-50-4, Aluminum barium magnesium oxide (Al<sub>16</sub>BaMg<sub>2</sub>O<sub>27</sub>) 99533-22-9, Calcium magnesium chloride silicate (Ca<sub>8</sub>MgCl<sub>2</sub>(SiO<sub>4</sub>)<sub>4</sub>) 352033-92-2 494201-96-6, Aluminum cerium gadolinium yttrium oxide (Al<sub>5</sub>(Ce,Gd,Y)<sub>3</sub>O<sub>12</sub>) 494201-97-7, Aluminum cerium gallium yttrium oxide ((Al,Ga)<sub>5</sub>(Ce,Y)<sub>3</sub>O<sub>12</sub>) 494201-98-8 494201-99-9, Gadolinium vanadium yttrium borate oxide ((Gd,Y)V<sub>2</sub>O<sub>3</sub>(BO<sub>3</sub>)<sub>2</sub>O-101-4)

RL: DEV (Device component use); USES (Uses)

(phosphor; light-emitting device with org. layer doped with phosphor fabricated by using)

IT 7439-96-5, Manganese, uses 7440-53-1, Europium, uses 7440-69-9, Bismuth, uses 16397-91-4, Manganese(2+), uses 16910-54-6, Europium(2+), uses 19768-33-3, Manganese(4+), uses 22541-18-0, Europium(3+), uses 23713-46-4, Bismuth(3+), uses

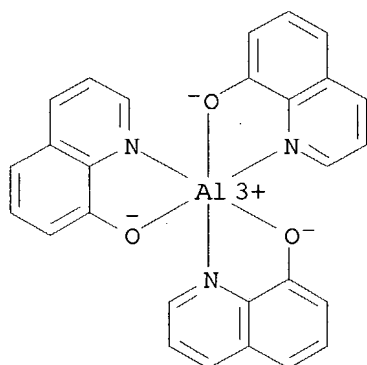
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)

(phosphor; light-emitting device with org. layer doped with phosphor fabricated by using)

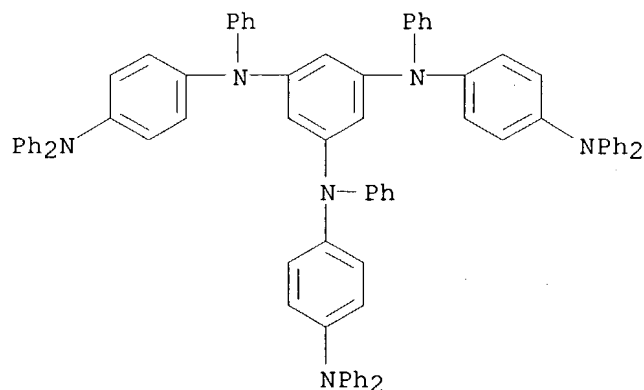
RE.CNT 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS RECORD  
RE

- (1) Forrest; US 5998803 A 1999 HCAPLUS
- (2) Junji, K; Science 1995, V267, P1332
- (3) Lawandy; US 5943354 A 1999 HCAPLUS
- (4) Meyers, R; Encyclopedia of Physical Science and Technology, 1987, V7, P230
- (5) Onitsuka; US 6023371 A 2000
- (6) Shi; US 5683823 A 1997 HCAPLUS
- (7) Soules; US 6252254 B1 2001 HCAPLUS
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- (9) Tanaka; US 5717289 A 1998 HCAPLUS
- (10) Tang; US 4769292 A 1988 HCAPLUS
- (11) Tang; US 5294870 A 1994 HCAPLUS
- (12) Tokailin; US 5126214 A 1992 HCAPLUS

(13) Vriens; US 5813753 A 1998  
 IT 2085-33-8, Tris(8-quinolinolato)aluminum  
 RL: **DEV (Device component use)**; USES (Uses)  
 (electron injection material; light-emitting **device** with org.  
 layer doped with phosphor fabricated by using)  
 RN 2085-33-8 HCAPLUS  
 CN Aluminum, tris(8-quinolinolato-.kappa.N1,.kappa.O8)- (9CI) (CA INDEX  
 NAME)



IT 153521-90-5, 1,3,5-Tris[N-(4-diphenylaminophenyl)phenylamino]  
 benzene  
 RL: **DEV (Device component use)**; USES (Uses)  
 (org. **light emitting** material; **light-**  
**emitting device** with org. layer doped with phosphor  
 fabricated by using)  
 RN 153521-90-5 HCAPLUS  
 CN 1,3,5-Benzenetriamine, N,N',N''-tris[4-(diphenylamino)phenyl]-N,N',N''-  
 triphenyl- (9CI) (CA INDEX NAME)



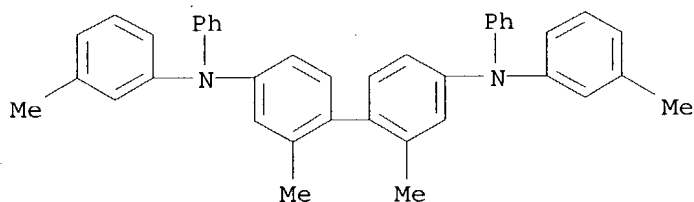
L47 ANSWER 6 OF 24 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2002:963813 HCAPLUS  
 DN 138:30905  
 TI Organic electroluminescent element and full color display  
 IN Oshiyama, Tomohiro; Yamada, Taketoshi; Kinoshita, Motoi; Kita, Hiroshi

PA Konica Corporation, Japan  
 SO Eur. Pat. Appl., 57 pp.  
 CODEN: EPXXDW  
 DT Patent  
 LA English  
 IC ICM H01L051-20  
 ICS H01L027-00  
 CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)  
 Section cross-reference(s): 74, 76

FAN.CNT 1

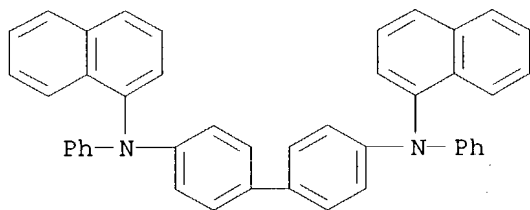
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1267428	A2	20021218	EP 2002-254090	20020612
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
	US 2003091860	A1	20030515	US 2002-167120	20020610
	JP 2003064355	A2	20030305	JP 2002-171356	20020612
PRAI	JP 2001-181543	A	20010615		
AB	Org. electroluminescent elements are described which comprise a light-emitting layer contg. a fluorescent compd. and a phosphorescent compd., the fluorescent compd. having a nitrogen atom no. to carbon atom no. ratio in the mol. (N/C) of 0-0.05 and for which the max. emission wavelength of light emitted according to electroluminescence of the element is longer than the max. fluorescence wavelength of the fluorescent compd. Displays employing the elements are also described.				
ST	org <b>electroluminescent</b> element display fluorescent phosphorescent <b>mixt</b>				
IT	Electroluminescent devices (displays; org. electroluminescent elements using mixed fluorescent and phosphorescent materials and displays employing them)				
IT	Luminescent screens (electroluminescent; org. electroluminescent elements using mixed fluorescent and phosphorescent materials and displays employing them)				
IT	Electroluminescent devices Fluorescent substances Phosphorescent substances (org. electroluminescent elements using mixed fluorescent and phosphorescent materials and displays employing them)				
IT	2085-33-8, Tris(8-hydroxyquinolinato)aluminum 4733-39-5, Bathocuproin 7429-90-5, Aluminum, uses 7440-04-2D, Osmium, compds. 7789-24-4, Lithium fluoride, uses 31248-39-2 37271-44-6 50926-11-9, ITO 51325-95-2, DCM2 <b>65181-79-5</b> 94928-86-6 <b>123847-85-8</b> , .alpha.-NPD 149005-33-4 337526-85-9 337526-98-4 343978-78-9 343978-79-0 400654-08-2 405171-49-5 405172-39-6 405173-85-5 <b>453590-51-7</b> 478262-73-6 478262-74-7 <b>478262-75-8</b> <b>478262-76-9</b> <b>478262-77-0</b> 478262-78-1 478262-79-2 <b>478262-80-5</b> RL: DEV (Device component use); USES (Uses) (org. <b>electroluminescent</b> elements using mixed fluorescent and phosphorescent materials and displays employing them)				
IT	<b>65181-79-5</b> <b>123847-85-8</b> , .alpha.-NPD <b>453590-51-7</b> <b>478262-75-8</b> <b>478262-76-9</b> <b>478262-77-0</b> <b>478262-80-5</b> RL: DEV (Device component use); USES (Uses) (org. <b>electroluminescent</b> elements using mixed fluorescent and phosphorescent materials and displays employing them)				
RN	65181-79-5 HCAPLUS				

CN [1,1'-Biphenyl]-4,4'-diamine, 2,2'-dimethyl-N,N'-bis(3-methylphenyl)-N,N'-diphenyl- (9CI) (CA INDEX NAME)



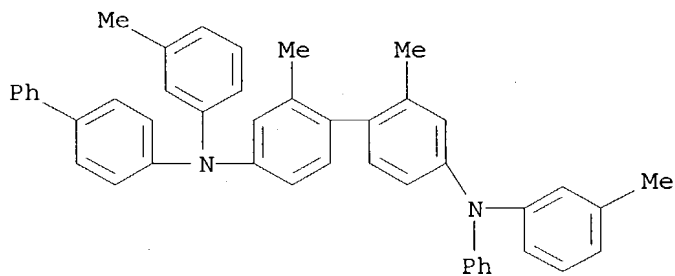
RN 123847-85-8 HCAPLUS

CN [1,1'-Biphenyl]-4,4'-diamine, N,N'-di-1-naphthalenyl-N,N'-diphenyl- (9CI) (CA INDEX NAME)



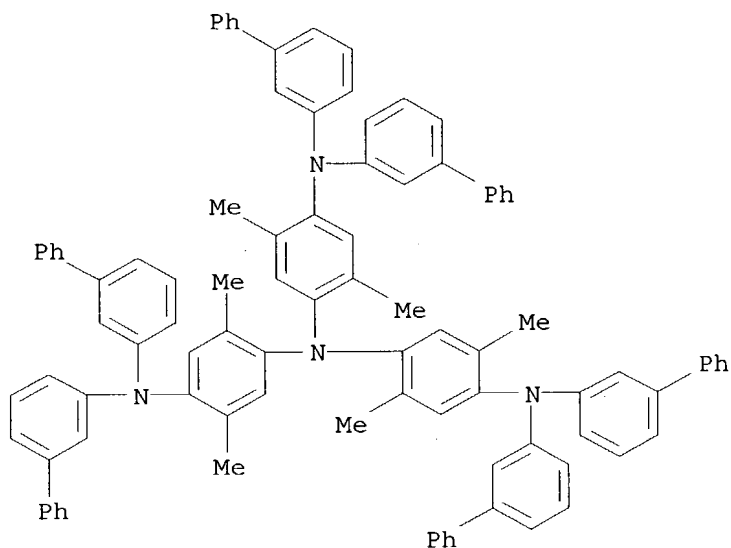
RN 453590-51-7 HCAPLUS

CN [1,1'-Biphenyl]-4,4'-diamine, N-[1,1'-biphenyl]-4-yl-2,2'-dimethyl-N,N'-bis(3-methylphenyl)-N'-phenyl- (9CI) (CA INDEX NAME)

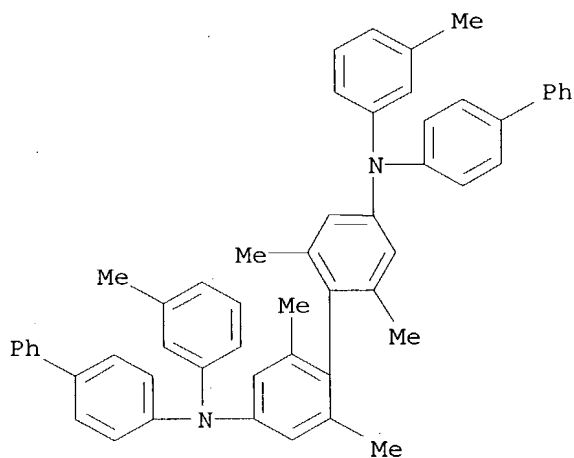


RN 478262-75-8 HCAPLUS

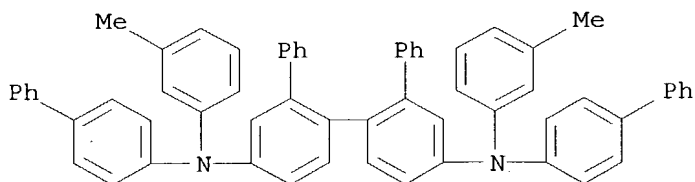
CN 1,4-Benzenediamine, N,N-bis[1,1'-biphenyl]-3-yl-N',N'-bis[4-(bis[1,1'-biphenyl]-3-ylamino)-2,5-dimethylphenyl]-2,5-dimethyl- (9CI) (CA INDEX NAME)



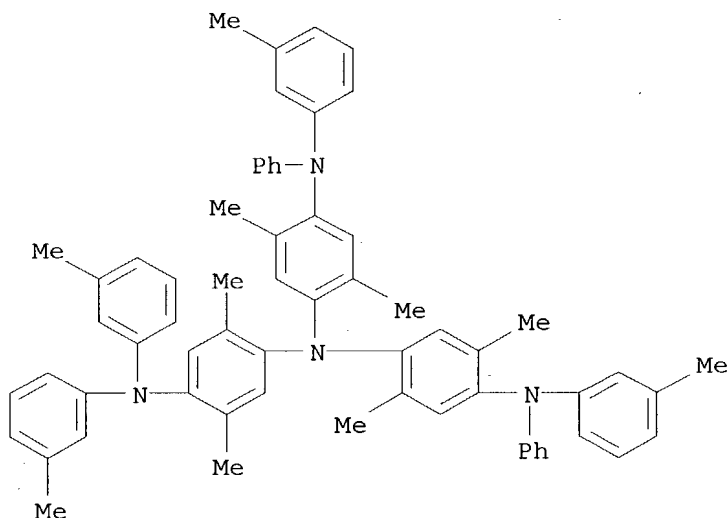
RN 478262-76-9 HCAPLUS  
 CN [1,1'-Biphenyl]-4,4'-diamine, N,N'-bis([1,1'-biphenyl]-4-yl)-2,2',6,6'-tetramethyl-N,N'-bis(3-methylphenyl)- (9CI) (CA INDEX NAME)



RN 478262-77-0 HCAPLUS  
 CN [1,1':2',1'':2'',1'''-Quaterphenyl]-4'',5'-diamine, N,N'-bis([1,1'-biphenyl]-4-yl)-N,N'-bis(3-methylphenyl)- (9CI) (CA INDEX NAME)



RN 478262-80-5 HCAPLUS  
 CN 1,4-Benzenediamine, N,N-bis[2,5-dimethyl-4-[(3-methylphenyl)phenylamino]phenyl]-2,5-dimethyl-N',N'-bis(3-methylphenyl)-(9CI) (CA INDEX NAME)



L47 ANSWER 7 OF 24 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2002:866467 HCAPLUS  
 DN 138:244985  
 TI Photoluminescence and electroluminescence of the exciplex formed between a terbium ternary complex and N,N'-diphenyl-N,N'-bis(3-methylphenyl)-1,1'-diphenyl-4,4'-diamine  
 AU Xin, H.; Guang, M.; Li, F. Y.; Bian, Z. Q.; Huang, C. H.; Ibrahim, K.; Liu, F. Q.  
 CS State Key Laboratory of Rare Earth Materials Chemistry and Applications, Peking University, Beijing, 100871, Peop. Rep. China  
 SO Physical Chemistry Chemical Physics (2002), 4(23), 5895-5898  
 CODEN: PPCPFQ; ISSN: 1463-9076  
 PB Royal Society of Chemistry  
 DT Journal  
 LA English  
 CC 73-5 (**Optical**, Electron, and Mass Spectroscopy and Other Related Properties)  
 Section cross-reference(s): 76, 78  
 AB We demonstrate the photoluminescence (PL) and electroluminescence (EL) of the exciplex formed between a terbium complex tris-(1-phenyl-3-methyl-4-isobutyryl-5-pyrazolone)-1,10-phenanthroline-terbium Tb(PMIP)3(Phen) and the hole-transporting material N,N'-diphenyl-N,N'-bis(3-methylphenyl)-1,1'-diphenyl-4,4'-diamine (TPD). Exptl. results show that a new emission peaking at 540 nm from their 1:1 **mixt.** and the **electroluminescence** from the double layer **device** (ITO/TPD/Tb(PMIP)3(Phen)/Mg0.9Ag0.1) can be assigned to the exciplex formed between the excited state of TPD and the ground state of the terbium complex. By suppressing the formation of the exciplex by changing the carrier combination zone, pure green light from the central terbium ion with highest brightness 250 cd m<sup>-2</sup> at 15 V, power efficiency of 0.31

lm W-1 and turn-on voltage as low as 3 V can be obtained from a **device** of ITO/TPD(10 nm)/Tb(PMIP)3(Phen)(80 nm)/BCP(20 nm)/Mg0.9Ag0.1. By doping TPD into the emitting layer, which facilitates the exciplex formation, bright yellow emission with highest brightness 1180 cd m<sup>-2</sup> at 17 V was obtained from a **device** of ITO/TPD(20 nm)/Tb(PMIP)3(Phen):TPD(2:1)(50 nm)/Tb(PMIP)3(Phen)(20 nm)/AlQ(30 nm)/Mg0.9Ag0.1.

ST luminescence electroluminescence exciplex terbium ternary complex TPD electroluminescent **device**

IT Fluorescence  
(as function of excitation wavelength; of TPD, Tb(PMIP)3(Phen) and their **mixt.**)

IT Fluorescence excitation  
UV and visible spectra  
(of TPD, Tb(PMIP)3(Phen) and their **mixt.**)

IT Band structure  
(of **device**; photoluminescence and electroluminescence of exciplex formed between Tb(PMIP)3(Phen) and TPD and their use in electroluminescent **devices**)

IT Electric current-potential relationship

Electroluminescent **devices**

Excimer fluorescence

Exciplex

Luminescence, electroluminescence

(photoluminescence and electroluminescence of exciplex formed between Tb(PMIP)3(Phen) and TPD and their use in electroluminescent **devices**)

IT Electric current carriers  
(transport; photoluminescence and electroluminescence of exciplex formed between Tb(PMIP)3(Phen) and TPD and their use in electroluminescent **devices**)

IT 4733-39-5, BCP

RL: **DEV (Device component use)**; PRP (Properties); USES (Uses)

(BCP; photoluminescence and electroluminescence of exciplex formed between Tb(PMIP)3(Phen) and TPD and their use in electroluminescent **devices** contg.)

IT 50926-11-9, Indium tin oxide

RL: **DEV (Device component use)**; PRP (Properties); USES (Uses)

(anode; photoluminescence and electroluminescence of exciplex formed between Tb(PMIP)3(Phen) and TPD and their use in electroluminescent **devices** contg.)

IT 182947-41-7, Magnesium 90, silver 10 (atomic)

RL: **DEV (Device component use)**; PRP (Properties); USES (Uses)

(cathode; photoluminescence and electroluminescence of exciplex formed between Tb(PMIP)3(Phen) and TPD and their use in electroluminescent **devices** contg.)

IT 220016-08-0

RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)

(emitting layer; photoluminescence and electroluminescence of exciplex formed between Tb(PMIP)3(Phen) and TPD and their use in electroluminescent **devices**)

IT **65181-78-4**, N,N'-Diphenyl-N,N'-bis(3-methylphenyl)-1,1'-diphenyl-4,4'-diamine

RL: **DEV (Device component use)**; MOA (Modifier or additive use);

PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)

(hole-transporting layer, dopant in emitting layer;  
**photoluminescence** and **electroluminescence** of exciplex  
 formed between Tb(PMIP)3(Phen) and TPD and their use in  
**electroluminescent devices**)

IT 2085-33-8, Alq3 123847-85-8, NPB

RL: DEV (Device component use); PRP (Properties); USES (Uses)  
 (photoluminescence and electroluminescence of  
 exciplex formed between Tb(PMIP)3(Phen) and TPD and their use in  
**electroluminescent devices** contg.)

RE.CNT 18 THERE ARE 18 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

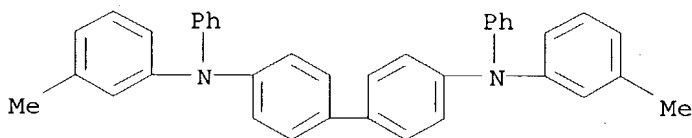
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- (2) Burroughes, J; Nature 1990, V347, P539 HCAPLUS
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- (8) Gao, D; Chem Phys Lett 2001, V350, P206 HCAPLUS
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- (12) Huang, C; Ultrathin Films for Optics and Electronics 2001
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- (15) Tamoto, N; Chem Mater 1997, V9, P1077 HCAPLUS
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- (17) Turro, N; Modern Molecular Photochemistry 1987
- (18) Zhang, Z; J Phys D: Appl Phys 2001, V34, P3083 HCAPLUS

IT 65181-78-4, N,N'-Diphenyl-N,N'-bis(3-methylphenyl)-1,1'-diphenyl-4,4'-diamine

RL: DEV (Device component use); MOA (Modifier or additive use);  
 PEP (Physical, engineering or chemical process); PRP (Properties); PYP  
 (Physical process); PROC (Process); USES (Uses)  
 (hole-transporting layer, dopant in emitting layer;  
**photoluminescence** and **electroluminescence** of exciplex  
 formed between Tb(PMIP)3(Phen) and TPD and their use in  
**electroluminescent devices**)

RN 65181-78-4 HCAPLUS

CN [1,1'-Biphenyl]-4,4'-diamine, N,N'-bis(3-methylphenyl)-N,N'-diphenyl-  
 (9CI) (CA INDEX NAME)



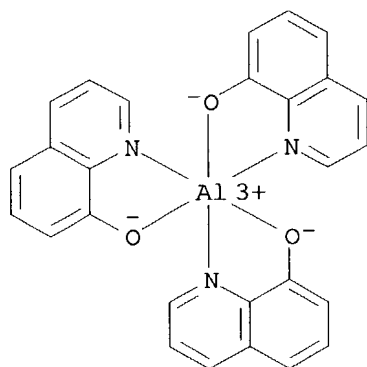
IT 2085-33-8, Alq3 123847-85-8, NPB

RL: DEV (Device component use); PRP (Properties); USES (Uses)  
 (photoluminescence and electroluminescence of  
 exciplex formed between Tb(PMIP)3(Phen) and TPD and their use in  
**electroluminescent devices** contg.)

RN 2085-33-8 HCAPLUS

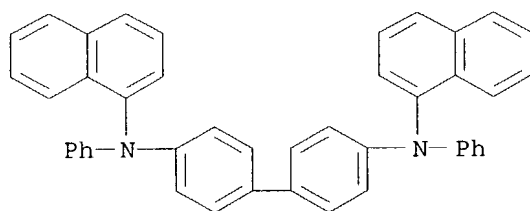
CN Aluminum, tris(8-quinolinolato-.kappa.N1,.kappa.O8)- (9CI) (CA INDEX  
 NAME)





RN 123847-85-8 HCAPLUS

CN [1,1'-Biphenyl]-4,4'-diamine, N,N'-di-1-naphthalenyl-N,N'-diphenyl- (9CI)  
(CA INDEX NAME)



L47 ANSWER 8 OF 24 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 2002:539396 HCAPLUS

DN 137:101230

TI Multicolor organic electroluminescent display device

IN Masumo, Kunio

PA Asahi Glass Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 8 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM H05B033-12

ICS H05B033-14

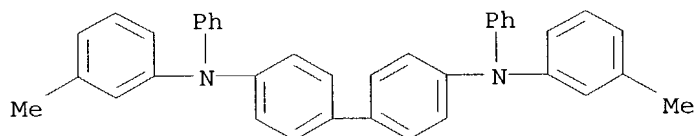
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

FAN.CNT 1

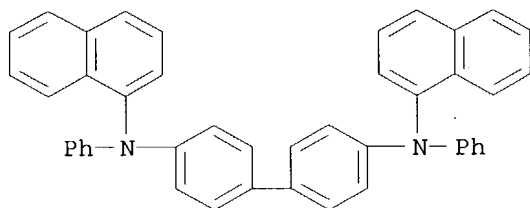
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2002203676	A2	20020719	JP 2000-398619	20001227
PRAI	JP 2000-398619		20001227		

AB The invention refers to a multicolor org. electroluminescent display device comprising a hole transport layer, a dye-doped layer and a luminescent/electron transport layer, wherein light emitted only from the luminescent/electron transport layer, and light emitted from both the luminescent/electron transport layer and the dye-doped layer produce two different colors of light from one pixel, and the resulting light, as obsd. from above, is a **mixt.** of the **two** colors.

ST electroluminescent display multicolor imaging device  
 IT Electroluminescent devices  
     (displays; multicolor org. electroluminescent display device)  
 IT Luminescent screens  
     (electroluminescent; multicolor org. electroluminescent display device)  
 IT Optical imaging devices  
     (multicolor org. electroluminescent display device)  
 IT 517-51-1, Rubrene 2085-33-8, Aluminum tris(8-hydroxyquinolino)  
 4733-39-5, Bathocuproin 51325-95-2, DCM 2 **65181-78-4**, TPD  
**123847-85-8**, .alpha.-NPD  
 RL: DEV (Device component use); USES (Uses)  
     (multicolor org. **electroluminescent** display device)  
 IT **65181-78-4**, TPD **123847-85-8**, .alpha.-NPD  
 RL: DEV (Device component use); USES (Uses)  
     (multicolor org. **electroluminescent** display device)  
 RN 65181-78-4 HCAPLUS  
 CN [1,1'-Biphenyl]-4,4'-diamine, N,N'-bis(3-methylphenyl)-N,N'-diphenyl-  
 (9CI) (CA INDEX NAME)



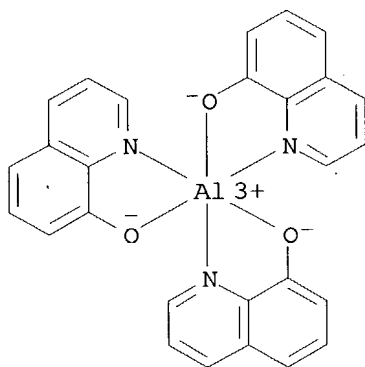
RN 123847-85-8 HCAPLUS  
 CN [1,1'-Biphenyl]-4,4'-diamine, N,N'-di-1-naphthalenyl-N,N'-diphenyl- (9CI)  
 (CA INDEX NAME)



L47 ANSWER 9 OF 24 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2002:450225 HCAPLUS  
 DN 137:25995  
 TI Organic blue- and white-light-emitting **devices**  
 IN Fujii, Hiroyuki  
 PA Sanyo Electric Co., Ltd., Japan  
 SO U.S. Pat. Appl. Publ., 18 pp.  
 CODEN: USXXCO  
 DT Patent  
 LA English  
 IC ICM H05B033-14  
 NCL 428690000  
 CC 73-11 (**Optical**, Electron, and Mass Spectroscopy and Other  
 Related Properties)  
 Section cross-reference(s): 27, **76**, 78  
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2002071963	A1	20020613	US 2001-11313	20011211
	JP 2002184581	A2	20020628	JP 2000-379404	20001213
	EP 1215945	A2	20020619	EP 2001-310369	20011212
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
PRAI	JP 2000-379404	A	20001213		
AB	Org. light-emitting <b>devices</b> are described which comprise an anode; a cathode; and a luminescent substance placed between the anode and the cathode, where the luminescent substance includes at least a mol. substance in which an absorption edge of the longest wavelength in an optical absorption spectrum in a visible light range is located at a shorter wavelength as compared to that of 4,4'-bis(carbazol-9-yl)biphenyl. Thus, white-emitting luminescent <b>devices</b> were fabricated and characterized which contain a mixed luminescent layer including 4,4',4''-tri(N-carbazolyl)triphenylamine as a luminescent substance and fac-tris(2-phenylpyridine)iridium as a substance emitting light through a triplet excited state.				
ST	org light emitting <b>device</b> blue white; OLED white blue				
IT	Electroluminescent <b>devices</b> (blue- and white-emitting org. electroluminescent <b>devices</b> )				
IT	Transition metal complexes RL: <b>DEV (Device component use)</b> ; USES (Uses) (heterocyclic compd.; org. light emitting <b>devices</b> using luminescent material emitting through triplet excited state and based on)				
IT	Luminescent substances (org. light emitting <b>devices</b> using luminescent material emitting through triplet excited state)				
IT	Group IB element compounds Group VIII element compounds RL: <b>DEV (Device component use)</b> ; USES (Uses) (org. light emitting <b>devices</b> using luminescent material emitting through triplet excited state and based on)				
IT	Heterocyclic compounds RL: <b>DEV (Device component use)</b> ; USES (Uses) (transition metal complexes; org. light emitting <b>devices</b> using luminescent material emitting through triplet excited state and based on)				
IT	50926-11-9, Indium tin oxide RL: <b>DEV (Device component use)</b> ; PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses) (anode; fabrication of org. white-light-emitting <b>devices</b> using)				
IT	221042-24-6 RL: <b>DEV (Device component use)</b> ; PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses) (cathode; fabrication of org. white-light-emitting <b>devices</b> using)				
IT	4733-39-5, 2,9-Dimethyl-4,7-diphenyl-1,10-phenanthroline RL: <b>DEV (Device component use)</b> ; PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses) (electron-blocking layer; fabrication of org. white-light-emitting <b>devices</b> using)				

- IT 2085-33-8, Alq3  
 RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)  
 (electron-injection layer; fabrication of org. white-light-emitting devices using)
- IT 124729-98-2  
 RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)  
 (hole-injection layer; fabrication of org. white-light-emitting devices using)
- IT 123847-85-8, 4,4'-Bis[N-(1-naphthyl)-N-phenylamino]biphenyl  
 RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)  
 (hole-transporting layer; fabrication of org. white-light-emitting devices using)
- IT 200052-70-6  
 RL: DEV (Device component use); USES (Uses)  
 (luminescent layer contg.; fabrication of org. white-light-emitting devices using)
- IT 94928-86-6, fac-Tris(2-phenylpyridine)iridium 139092-78-7 434938-12-2  
 RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)  
 (luminescent layer of mixt. contg.; fabrication of org. white-light-emitting devices using)
- IT 7439-88-5D, Iridium, compd. 7440-04-2D, Osmium, compd. 7440-06-4D, Platinum, compd. 7440-57-5D, Gold, compd.  
 RL: DEV (Device component use); USES (Uses)  
 (org. light emitting devices using luminescent material emitting through triplet excited state and contg.)
- IT 2085-33-8, Alq3  
 RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)  
 (electron-injection layer; fabrication of org. white-light-emitting devices using)
- RN 2085-33-8 HCAPLUS  
 CN Aluminum, tris(8-quinolinolato-.kappa.N1,.kappa.O8)- (9CI) (CA INDEX NAME)



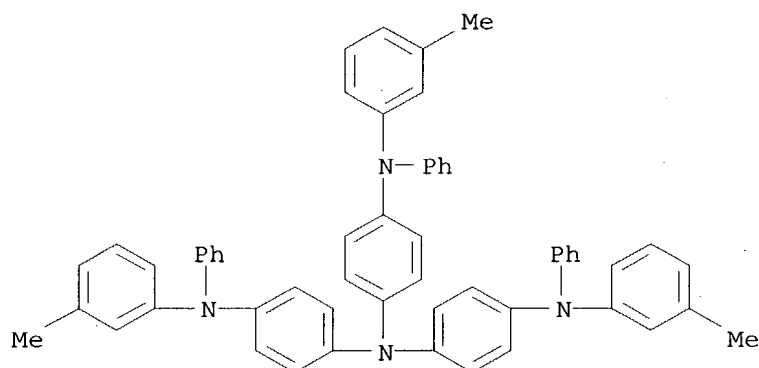
IT 124729-98-2

RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)

(hole-injection layer; fabrication of org. white-light-emitting devices using)

RN 124729-98-2 HCAPLUS

CN 1,4-Benzenediamine, N-(3-methylphenyl)-N',N'-bis[4-[(3-methylphenyl)phenylamino]phenyl]-N-phenyl- (9CI) (CA INDEX NAME)



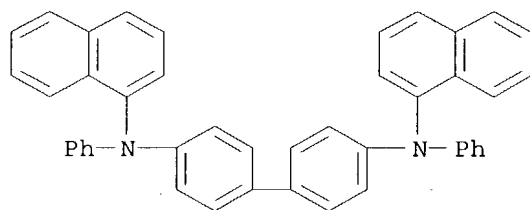
IT 123847-85-8, 4,4'-Bis[N-(1-naphthyl)-N-phenylamino]biphenyl

RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)

(hole-transporting layer; fabrication of org. white-light-emitting devices using)

RN 123847-85-8 HCAPLUS

CN [1,1'-Biphenyl]-4,4'-diamine, N,N'-di-1-naphthalenyl-N,N'-diphenyl- (9CI) (CA INDEX NAME)



L47 ANSWER 10 OF 24 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 2002:450155 HCAPLUS

DN 137:25991

TI Organic electroluminescent **devices** having a liquid crystal layer and processes for producing the **devices**

IN Moriyama, Takashi; Okada, Shinjiro; Tsuboyama, Akira; Takiguchi, Takao; Miura, Seishi; Kamatani, Jun; Furugori, Manabu

PA Japan

SO U.S. Pat. Appl. Publ., 12 pp.

CODEN: USXXCO

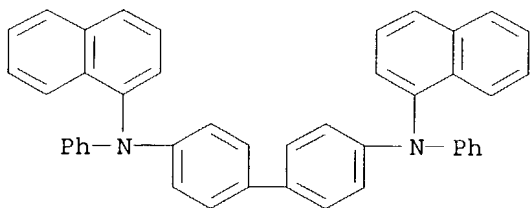
KATHLEEN FULLER EIC 1700/PARKER LAW 308-4290

DT Patent  
 LA English  
 IC ICM H01J001-62  
 NCL 313504000  
 CC 73-11 (**Optical**, Electron, and Mass Spectroscopy and Other  
 Related Properties)  
 Section cross-reference(s): 74, 75, 76

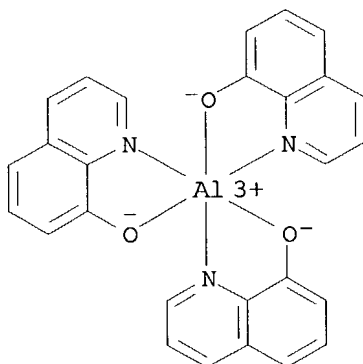
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2002070662	A1	20020613	US 2001-924517	20010809
	JP 2003068469	A2	20030307	JP 2001-237456	20010806
PRAI	JP 2000-243588	A	20000811		
	JP 2001-181061	A	20010615		
	JP 2001-237456	A	20010806		
AB	Org. electroluminescent <b>devices</b> are described which comprise a pair of substrates each provided with an electrode; an org. luminescent layer; and a layer of a liq. crystal material, resp. disposed between the substrates; where the liq. crystal material has an isotropic phase transition temp. < the glass transition temp. of the org. luminescent material, and the liq. crystal layer has been formed by disposing the liq. crystal material on the org. luminescent layer in an isotropic phase state at a temp. < the glass transition temp. of the org. luminescent material and cooling the liq. crystal material to a temp. < the isotropic phase transition temp. Processes for fabricating the org. electroluminescent <b>devices</b> are also discussed.				
ST	org electroluminescent <b>device</b> liq crystal fabrication				
IT	Liquid crystals (discotic; org. electroluminescent <b>devices</b> having a liq. crystal layer and processes for their fabrication)				
IT	Electroluminescent <b>devices</b> Electronic <b>device</b> fabrication Liquid crystals (org. electroluminescent <b>devices</b> having a liq. crystal layer and processes for their fabrication)				
IT	Glass substrates (org. electroluminescent <b>devices</b> having a liq. crystal layer and processes for their fabrication using)				
IT	Adhesives (photocurable, pair of substrates attached using; org. electroluminescent <b>devices</b> having a liq. crystal layer and processes for their fabrication)				
IT	Liquid crystals (smectic; org. electroluminescent <b>devices</b> having a liq. crystal layer and processes for their fabrication)				
IT	Plastics, uses RL: <b>DEV (Device component use)</b> ; USES (Uses) (substrate; org. electroluminescent <b>devices</b> having a liq. crystal layer and processes for their fabrication)				
IT	7429-90-5, Aluminum, uses RL: <b>DEV (Device component use)</b> ; PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses) (cathode; org. electroluminescent <b>devices</b> having a liq. crystal layer and processes for their fabrication using)				
IT	123847-85-8, .alpha.-NPD RL: <b>DEV (Device component use)</b> ; PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses) (hole-transporting layer; org. <b>electroluminescent</b>				

- devices** having a liq. crystal layer and processes for their fabrication using)
- IT 70351-86-9 90430-82-3 332104-82-2  
 RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)  
 (liq. crystal; org. electroluminescent **devices** having a liq. crystal layer and processes for their fabrication using)
- IT 2085-33-8, Alq3  
 RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)  
 (luminescent layer; org. electroluminescent **devices** having a liq. crystal layer and processes for their fabrication using)
- IT 221147-25-7  
 RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)  
 (mixt. contg. liq. cryst.; org. **electroluminescent devices** having a liq. crystal layer and processes for their fabrication using)
- IT 1518-16-7, TCNQ  
 RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)  
 (mixt. contg.; org. **electroluminescent devices** having a liq. crystal layer and processes for their fabrication using)
- IT 50926-11-9, Indium tin oxide  
 RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)  
 (org. electroluminescent **devices** having a liq. crystal layer and processes for their fabrication using)
- IT 7631-86-9, Silica, uses  
 RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)  
 (substrate treated with soln. contg. silica beads; org. electroluminescent **devices** having a liq. crystal layer and processes for their fabrication using)
- IT 123847-85-8, .alpha.-NPD  
 RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)  
 (hole-transporting layer; org. **electroluminescent devices** having a liq. crystal layer and processes for their fabrication using)
- RN 123847-85-8 HCAPLUS  
 CN [1,1'-Biphenyl]-4,4'-diamine, N,N'-di-1-naphthalenyl-N,N'-diphenyl- (9CI)  
 (CA INDEX NAME)



IT 2085-33-8, Alq3  
 RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)  
 (luminescent layer; org. electroluminescent **devices** having a liq. crystal layer and processes for their fabrication using)  
 RN 2085-33-8 HCAPLUS  
 CN Aluminum, tris(8-quinolinolato-.kappa.N1,.kappa.O8)- (9CI) (CA INDEX NAME)

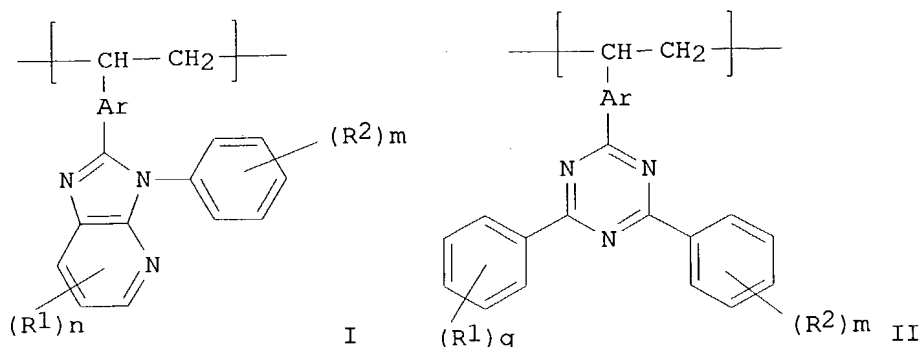


L47 ANSWER 11 OF 24 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2002:354001 HCAPLUS  
 DN 136:377202  
 TI Light-emitting device and material therefor  
 IN Okada, Hisashi; Ise, Toshihiro; Mishima, Masayuki; Taguchi, Toshiki  
 PA Fuji Photo Film Co., Ltd., Japan  
 SO U.S. Pat. Appl. Publ., 91 pp.  
 CODEN: USXXCO  
 DT Patent  
 LA English  
 IC ICM H05B033-14  
 ICS C08F026-06  
 NCL 428690000  
 CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)  
 Section cross-reference(s): 27, 28, 38, 76

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2002055014	A1	20020509	US 2001-935711	20010824
	JP 2002319491	A2	20021031	JP 2001-236419	20010803
PRAI	JP 2000-254171	A	20000824		
	JP 2001-38718	A	20010215		
	JP 2001-236419	A	20010803		
OS	MARPAT 136:377202				
GI					





AB Light-emitting devices comprising a pair of electrodes formed on a substrate and org. compd. layers comprising a light-emitting layer provided in between the electrodes are described in which .gtoreq.1 of the org. compd. layers comprises a heterocyclic compd. having .gtoreq.2 atoms and a phosphorescent compd.; polymers with repeating units described by the general formulas I and II (Ar = arylene or divalent heterocyclic group; R1 and R2 = independently selected H or substituent; n = 0-3; q = 0-5; and m = 0-5), which may be employed as the heterocyclic compds. in the devices, are also described. The devices may also employ polymers of heterocyclic compds. from which AR is absent. The phosphorescent compd. may be an org. metal complex.

ST **electroluminescent** device heterocycle phosphorescent compd  
**mixt** active layer; polymer heterocycle phosphorescent compd  
**mixt** active layer **electroluminescent** device

IT Phosphorescent substances  
(light-emitting devices with emitting layers including heterocyclic compds. and phosphorescent materials and heterocycle deriv. polymers for them)

IT Polycarbonates, uses  
RL: DEV (Device component use); USES (Uses)  
(light-emitting devices with emitting layers including heterocyclic compds. and phosphorescent materials and heterocycle deriv. polymers for them)

IT Electroluminescent devices  
(org.; light-emitting devices with emitting layers including heterocyclic compds. and phosphorescent materials and heterocycle deriv. polymers for them)

IT 147-14-8, Copper phthalocyanine 2085-33-8, Tris(8-hydroxyquinolinato)aluminum 4733-39-5, Bathocuproine 7429-90-5, Aluminum, uses 7789-24-4, Lithium fluoride, uses 12033-89-5, Silicon nitride, uses 15082-28-7 24964-91-8, Tris(4-bromophenyl)aminium hexachloroantimonate 25067-59-8, Poly(N-vinylcarbazole) 37271-44-6 38215-36-0, Coumarin-6 50926-11-9, ITO 51269-91-1 58328-31-7 **65181-78-4**, N,N'-Bis(3-methylphenyl)-N,N'-diphenylbenzidine 94928-86-6 153838-48-3 **173394-18-8** **182069-71-2** 343978-78-9 350025-75-1 350025-76-2 350025-78-4 350025-79-5 359014-69-0 370878-69-6 377092-13-2 422574-54-7, Silicon nitride oxide (SiN<sub>0.300.7</sub>) 422574-58-1 422574-60-5 422574-62-7 422574-66-1 422574-67-2 422574-68-3 422574-70-7 422574-72-9 422574-73-0 422574-74-1 422574-76-3 422574-77-4 422574-78-5 422574-84-3 422574-85-4 422574-86-5 422574-87-6 422574-88-7 422574-89-8 422574-90-1 423117-91-3 423117-92-4 423117-94-6 423117-96-8

423117-97-9 423117-99-1 423118-00-7 423118-01-8 423118-03-0  
 423118-05-2 423721-05-5 423721-07-7 423721-09-9

RL: DEV (Device component use); USES (Uses)

(light-emitting devices with emitting

layers including heterocyclic compds. and phosphorescent materials and heterocycle deriv. polymers for them)

IT 313950-73-1P 328238-10-4P 358974-66-0P 377092-02-9P 377092-06-3P  
 377092-10-9P 422574-56-9P 422574-64-9P 422574-83-2P

RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)

(light-emitting devices with emitting layers including heterocyclic compds. and phosphorescent materials and heterocycle deriv. polymers for them)

IT 62-53-3, Aniline, reactions 95-53-4, o-Toluidine, reactions 104-15-4, p-Toluenesulfonic acid, reactions 108-44-1, m-Toluidine, reactions 578-66-5, 8-Aminoquinoline 586-75-4, 4-Bromobenzoyl chloride 603-35-0, Triphenylphosphine, reactions 769-92-6 876-08-4, 4-Chloromethylbenzoyl chloride 2039-82-9, 4-Bromostyrene 2156-04-9, 4-Vinylphenylboronic acid 2351-37-3, 4,4'-Biphenyldicarbonyl chloride 3842-55-5, 2-Chloro-4,6-diphenyl-1,3,5-triazine 4422-95-1, 1,3,5-Benzenetricarbonyl trichloride 5470-18-8, 2-Chloro-3-nitropyridine

RL: RCT (Reactant); RACT (Reactant or reagent)

(light-emitting devices with emitting layers including heterocyclic compds. and phosphorescent materials and heterocycle deriv. polymers for them)

IT 34949-41-2P 54696-64-9P 54696-67-2P 78750-58-0P 350025-73-9P  
 350025-74-0P 377092-01-8P 377092-03-0P 377092-04-1P 377092-05-2P  
 377092-07-4P 377092-08-5P 422574-55-8P 422574-61-6P 422574-63-8P  
 422574-79-6P 422574-80-9P 422574-81-0P 422574-82-1P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(light-emitting devices with emitting layers including heterocyclic compds. and phosphorescent materials and heterocycle deriv. polymers for them)

IT 50851-57-5

RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)

(polyethylene dioxythiophene doped with; light-emitting devices with emitting layers including heterocyclic compds. and phosphorescent materials and heterocycle deriv. polymers for them)

IT 126213-51-2, Poly(3,4-ethylenedioxythiophene)

RL: DEV (Device component use); USES (Uses)

(polystyrene sulfonate-doped; light-emitting devices with emitting layers including heterocyclic compds. and phosphorescent materials and heterocycle deriv. polymers for them)

IT 65181-78-4, N,N'-Bis(3-methylphenyl)-N,N'-diphenylbenzidine  
 173394-18-8 182069-71-2

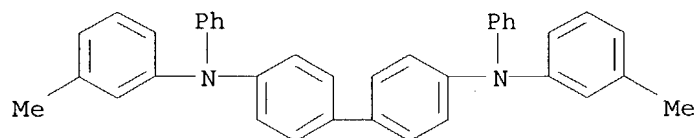
RL: DEV (Device component use); USES (Uses)

(light-emitting devices with emitting

layers including heterocyclic compds. and phosphorescent materials and heterocycle deriv. polymers for them)

RN 65181-78-4 HCAPLUS

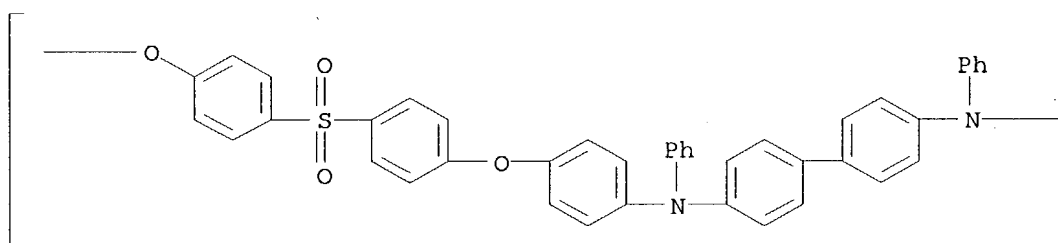
CN [1,1'-Biphenyl]-4,4'-diamine, N,N'-bis(3-methylphenyl)-N,N'-diphenyl-  
 (9CI) (CA INDEX NAME)



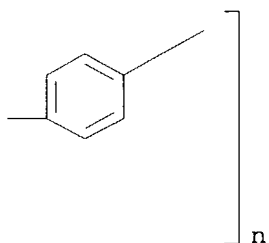
RN 173394-18-8 HCAPLUS

CN Poly[oxy-1,4-phenylenesulfonyl-1,4-phenyleneoxy-1,4-phenylene(phenylimino)[1,1'-biphenyl]-4,4'-diyl(phenylimino)-1,4-phenylene] (9CI) (CA INDEX NAME)

PAGE 1-A



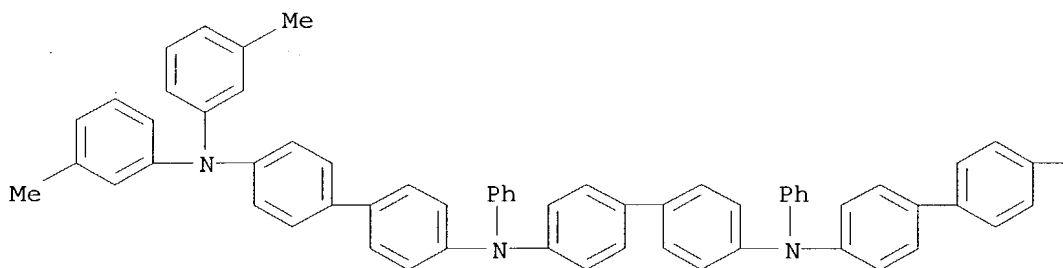
PAGE 1-B



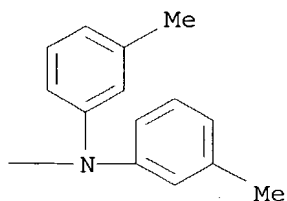
RN 182069-71-2 HCAPLUS

CN [1,1'-Biphenyl]-4,4'-diamine, N,N'-bis[4'-[bis(3-methylphenyl)amino][1,1'-biphenyl]-4-yl]-N,N'-diphenyl- (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 1-B



L47 ANSWER 12 OF 24 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2002:21720 HCAPLUS  
 DN 136:77054  
 TI Perylene derivatives of light-emitting material and organic  
 electroluminescent device using it  
 IN Toba, Yasumasa; Onikubo, Shunichi  
 PA Toyo Ink Mfg. Co., Ltd., Japan  
 SO Jpn. Kokai Tokkyo Koho, 33 pp.  
 CODEN: JKXXAF  
 DT Patent  
 LA Japanese  
 IC ICM C09K011-06  
 ICS C09K011-06; C07C211-61; C07C217-92; C07D209-82; C07D213-74;  
 C07D263-48; C07D265-38; C07D271-10; C07D279-26; C07D307-66;  
 C07D333-36; C07F005-00; H05B033-14  
 CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related  
 Properties)  
 Section cross-reference(s): 25

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2002003833	A2	20020109	JP 2000-190063	20000623
PRAI	JP 2000-190063		20000623		
OS	MARPAT 136:77054				
AB	The <b>light-emitting</b> material is a <b>mixt.</b> of .gtoreq.2 perylene derivs. Org. electroluminescent device having a light-emitting layer contg. the material is also claimed. The material emits yellow to red light with high luminescent efficiency and the device has high brightness and long life.				
ST	perylene deriv light emitting material org electroluminescent device; red yellow light emission perylene deriv electroluminescent device				
IT	<b>Electroluminescent</b> devices (perylene derivs. <b>mixt.</b> of <b>light-emitting</b> compds. with high luminescent efficiency for)				
IT	<b>227009-37-2P 252755-96-7P 252756-01-7P</b> <b>252756-13-1P</b> 384343-78-6P 384343-79-7P 384343-80-0P RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (perylene derivs. <b>mixt.</b> of <b>light-emitting</b> material with high <b>luminescent</b> efficiency for org. <b>electroluminescent</b> device)				
IT	252755-19-4 <b>278174-15-5</b> 282535-66-4 282535-70-0 384343-40-2 384343-41-3 384343-42-4 384343-43-5 384343-44-6 384343-45-7 384343-46-8 384343-47-9 384343-48-0 384343-49-1 384343-53-7				

384343-58-2 384343-61-7 384343-64-0  
 384343-65-1 384343-66-2 384343-67-3  
 384343-68-4 384343-69-5 384343-70-8  
 384343-72-0 384343-73-1 384343-74-2  
 384343-75-3 384343-76-4 384343-77-5  
 384343-85-5 384343-97-9 384343-98-0  
 384343-99-1

RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)

(perylene derivs. **mixt. of light-emitting**  
 material with high **luminescent** efficiency for org.  
**electroluminescent** device)

IT 90-30-2 620-93-9 23683-68-3, 3-Bromoperylene 56752-35-3,  
 3,9-Dibromoperylene 85514-20-1, 3,10-Dibromoperylene 103147-44-0  
 109465-97-6, 2-Bromoperylene 138206-23-2 252756-17-5,  
 3,10-Perylenediamine

RL: RCT (Reactant); RACT (Reactant or reagent)

(perylene derivs. **mixt. of light-emitting**  
 material with high luminescent efficiency for org. electroluminescent  
 device)

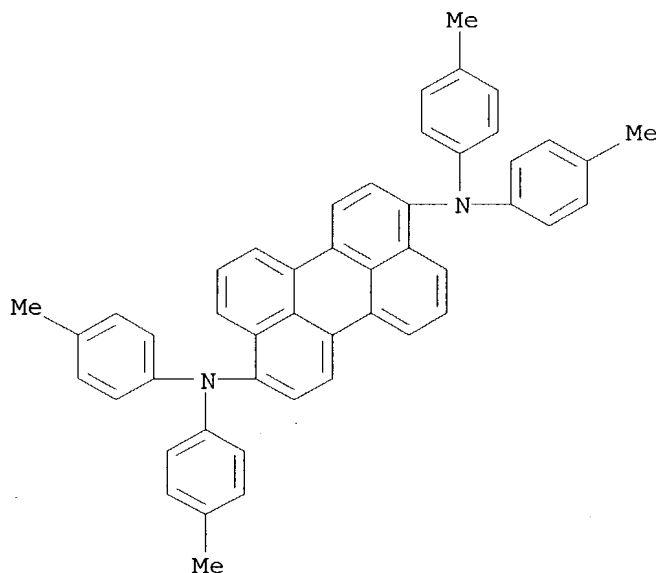
IT 227009-37-2P 252755-96-7P 252756-01-7P  
 252756-13-1P

RL: DEV (Device component use); IMF (Industrial manufacture); TEM  
 (Technical or engineered material use); PREP (Preparation); USES (Uses)

(perylene derivs. **mixt. of light-emitting**  
 material with high **luminescent** efficiency for org.  
**electroluminescent** device)

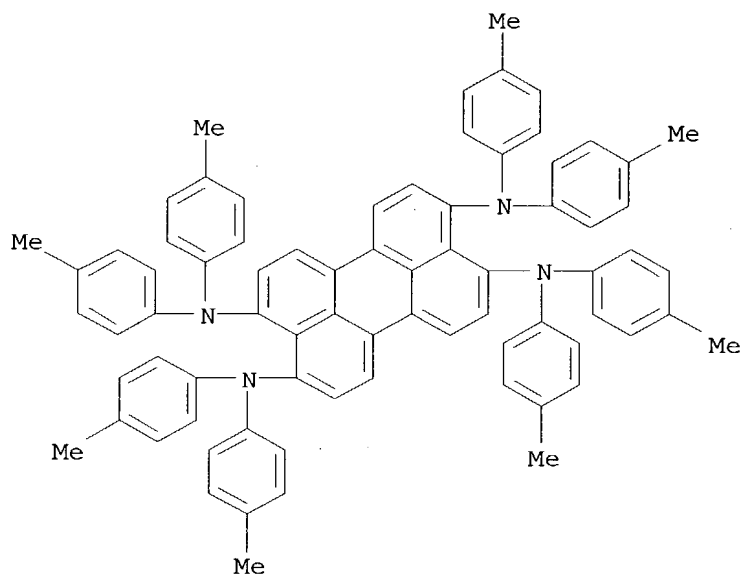
RN 227009-37-2 HCAPLUS

CN 3,9-Perylenediamine, N,N,N',N'-tetrakis(4-methylphenyl)- (9CI) (CA INDEX  
 NAME)

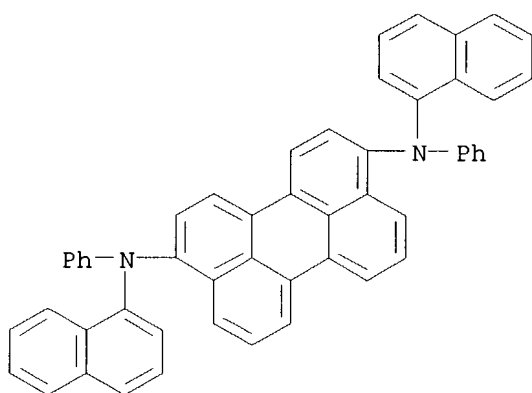


RN 252755-96-7 HCAPLUS

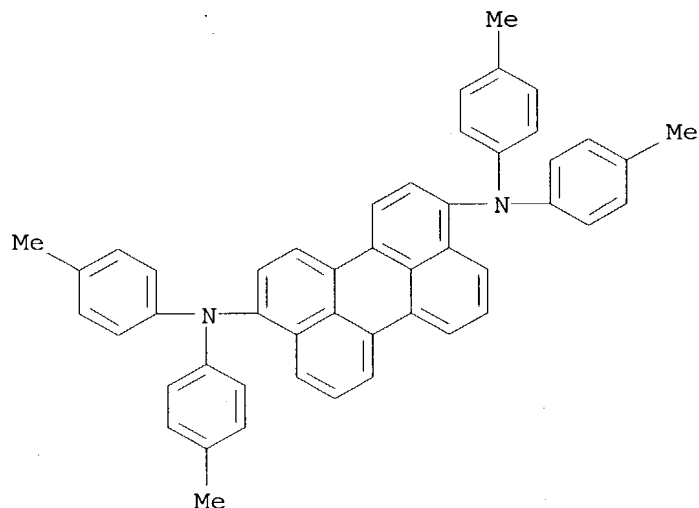
CN 3,4,9,10-Perylenetetramine, N,N,N',N',N'',N'',N''',N'''-octakis(4-  
 methylphenyl)- (9CI) (CA INDEX NAME)



RN 252756-01-7 HCAPLUS  
 CN 3,10-Perylenediamine, N,N'-di-1-naphthalenyl-N,N'-diphenyl- (9CI) (CA INDEX NAME)



RN 252756-13-1 HCAPLUS  
 CN 3,10-Perylenediamine, N,N,N',N'-tetrakis(4-methylphenyl)- (9CI) (CA INDEX NAME)



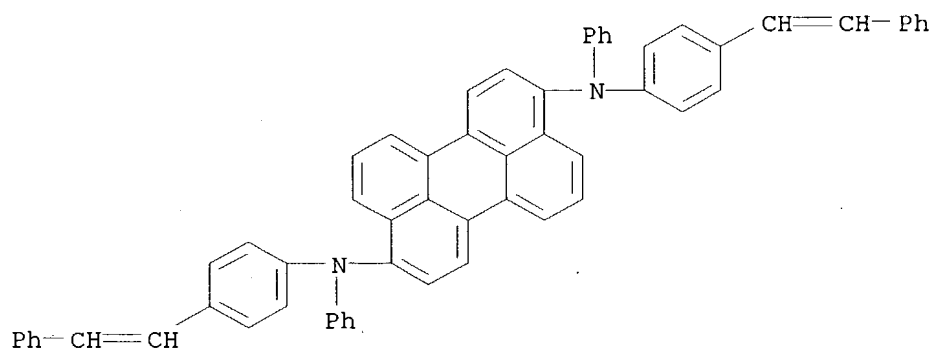
IT 278174-15-5 282535-66-4 282535-70-0  
 384343-40-2 384343-41-3 384343-42-4  
 384343-43-5 384343-44-6 384343-45-7  
 384343-46-8 384343-47-9 384343-48-0  
 384343-49-1 384343-53-7 384343-58-2  
 384343-61-7 384343-65-1 384343-66-2  
 384343-67-3 384343-68-4 384343-69-5  
 384343-70-8 384343-72-0 384343-73-1  
 384343-74-2 384343-75-3 384343-76-4  
 384343-77-5 384343-97-9 384343-98-0  
 384343-99-1

RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)

(perylene derivs. **mixt.** of **light-emitting** material with high **luminescent** efficiency for org. **electroluminescent** device)

RN 278174-15-5 HCAPLUS

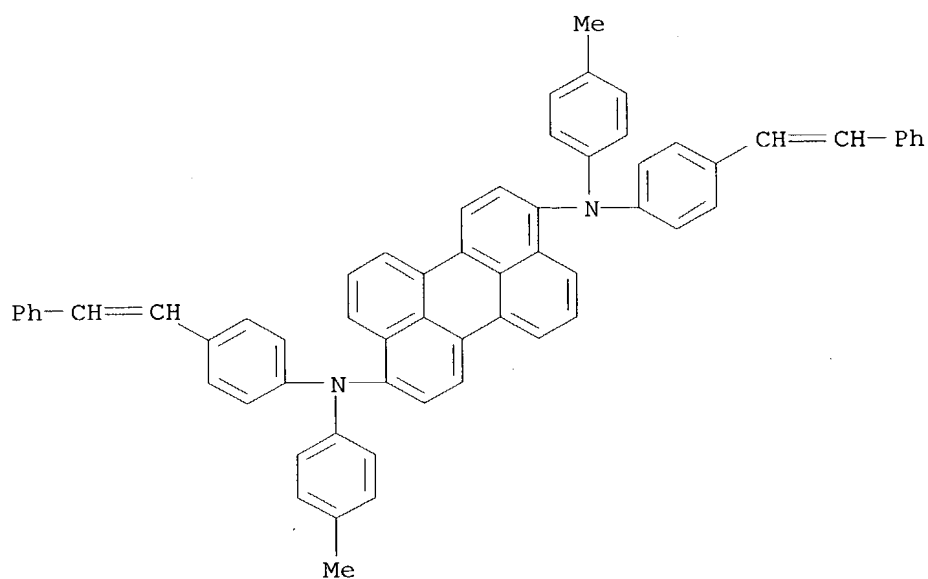
CN 3,9-Perylenediamine, N,N'-diphenyl-N,N'-bis[4-(2-phenylethenyl)phenyl]-(9CI) (CA INDEX NAME)



RN 282535-66-4 HCAPLUS

CN 3,9-Perylenediamine, N,N'-bis(4-methylphenyl)-N,N'-bis[4-(2-

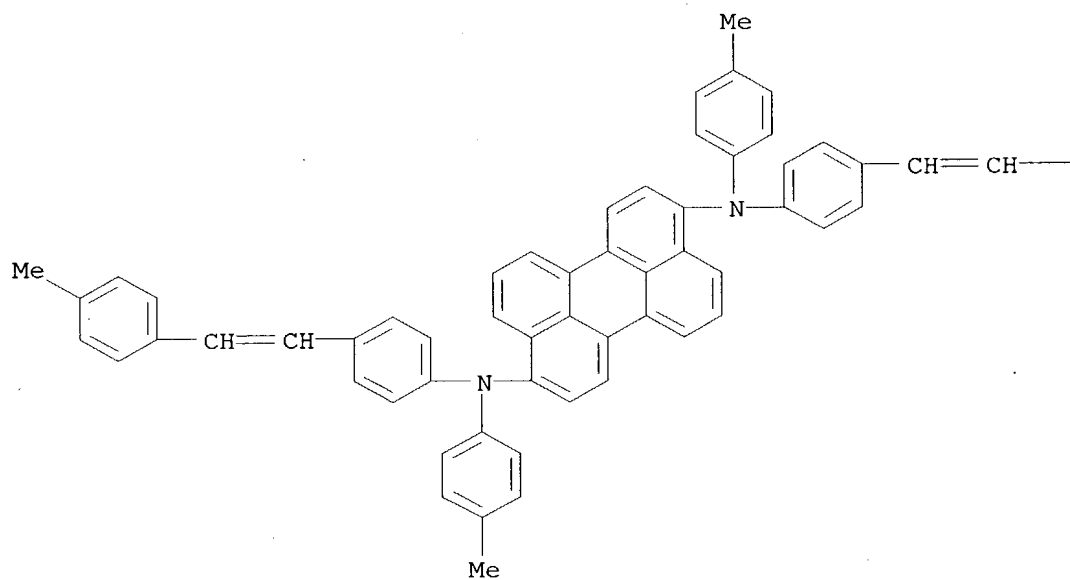
phenylethenyl)phenyl]- (9CI) (CA INDEX NAME)



RN 282535-70-0 HCAPLUS

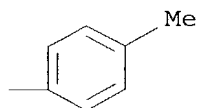
CN 3,9-Perylenediamine, N,N'-bis(4-methylphenyl)-N,N'-bis[4-[2-(4-methylphenyl)ethenyl]phenyl]- (9CI) (CA INDEX NAME)

PAGE 1-A

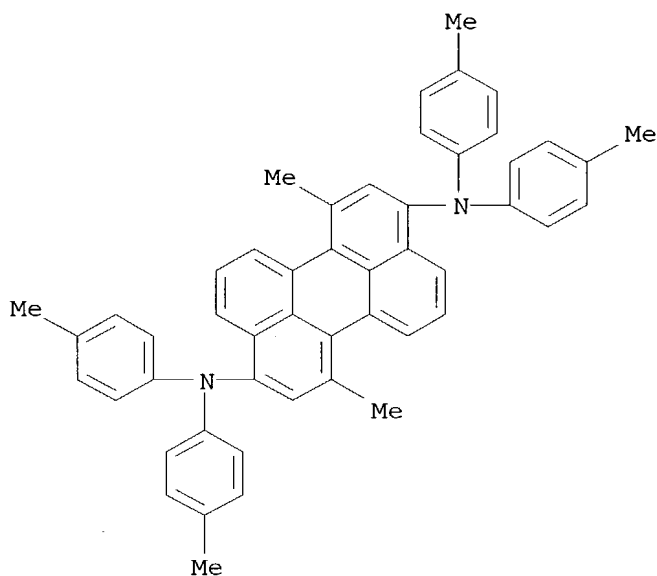


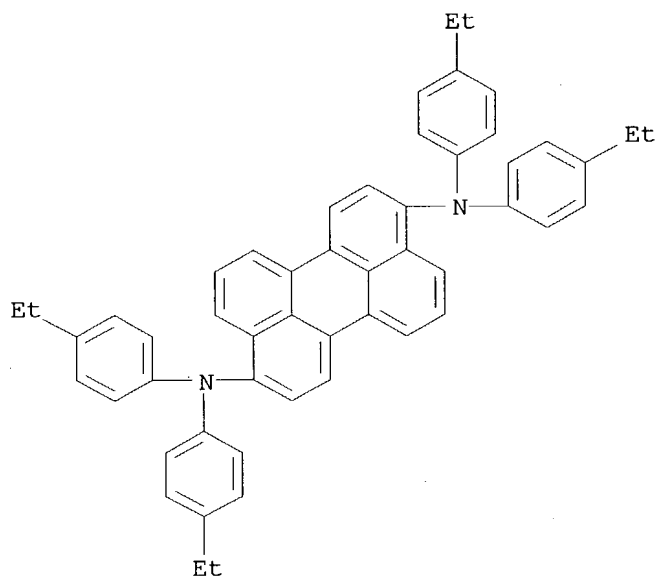


PAGE 1-B

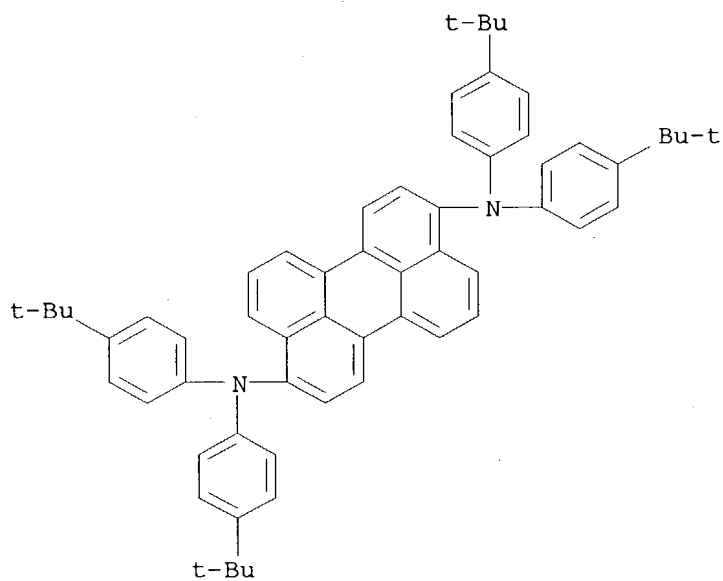


RN 384343-40-2 HCAPLUS  
CN 3,9-Perylenediamine, 1,7-dimethyl-N,N,N',N'-tetrakis(4-methylphenyl)-  
(9CI) (CA INDEX NAME)

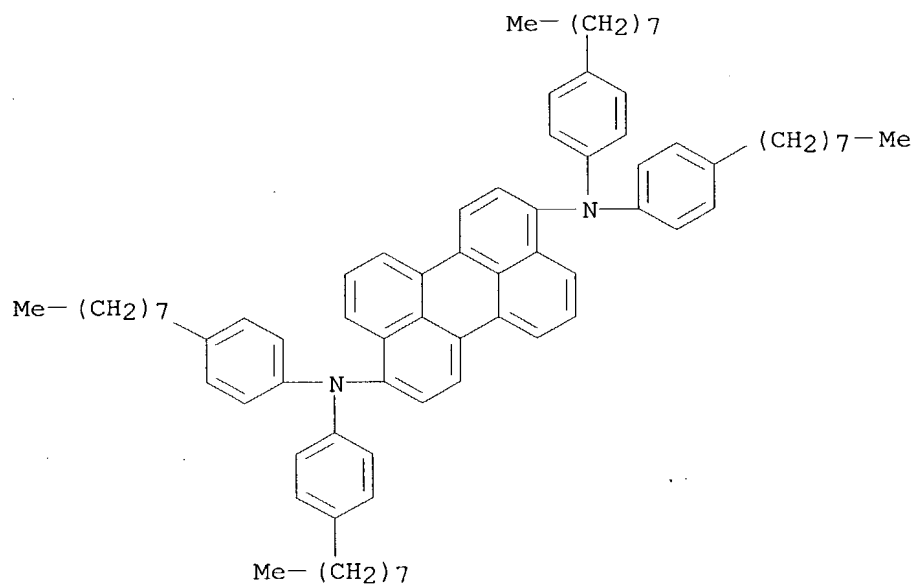




RN 384343-42-4 HCAPLUS  
CN 3,9-Perylenediamine, N,N,N',N'-tetrakis[4-(1,1-dimethylethyl)phenyl]-  
(9CI) (CA INDEX NAME)

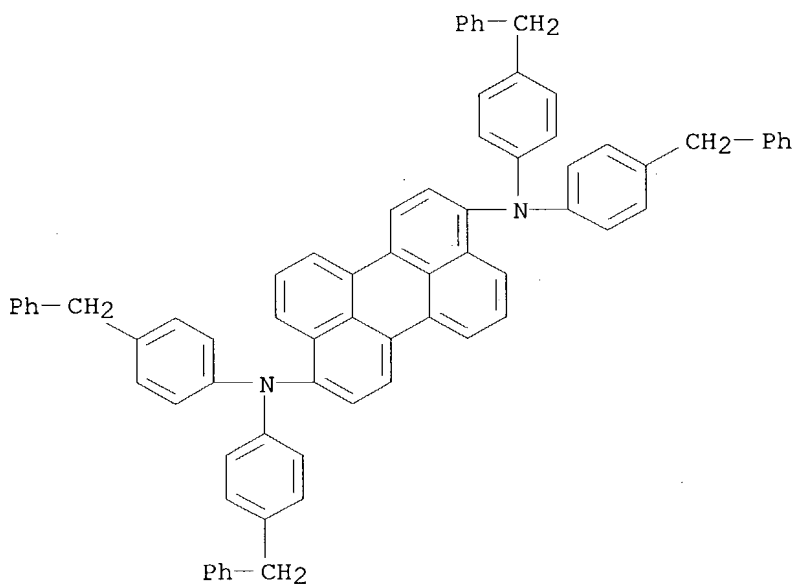


RN 384343-43-5 HCAPLUS  
CN 3,9-Perylenediamine, N,N,N',N'-tetrakis(4-octylphenyl)- (9CI) (CA INDEX  
NAME)



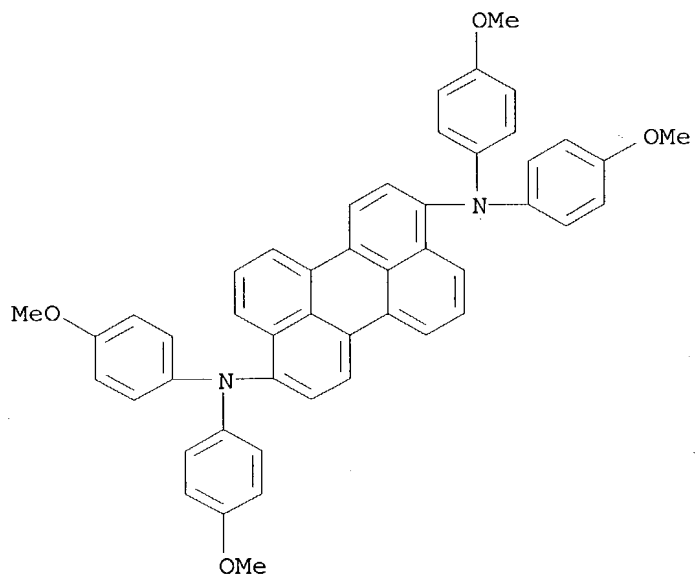
RN 384343-44-6 HCAPLUS

CN 3,9-Perylenediamine, N,N,N',N'-tetrakis[4-(phenylmethyl)phenyl]- (9CI)  
(CA INDEX NAME)

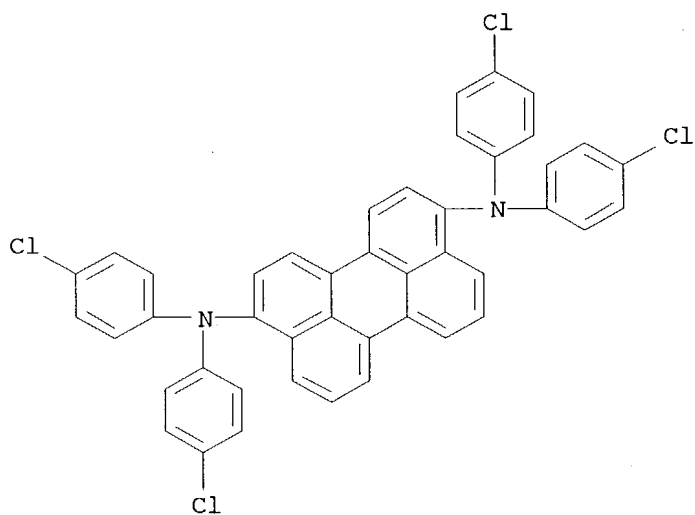


RN 384343-45-7 HCAPLUS

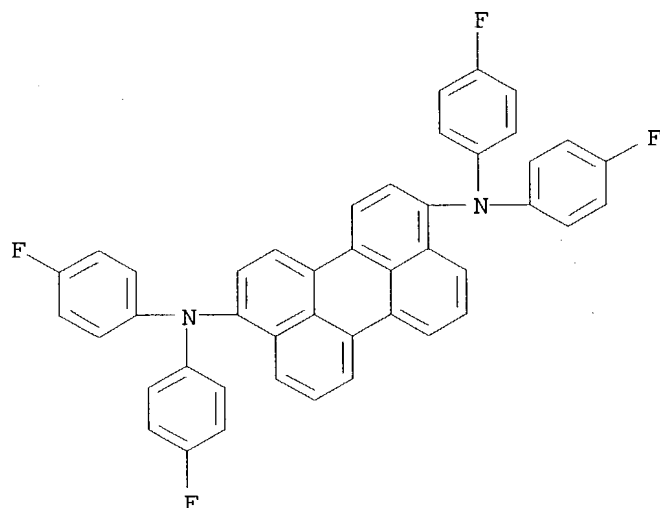
CN 3,9-Perylenediamine, N,N,N',N'-tetrakis(4-methoxyphenyl)- (9CI) (CA INDEX NAME)



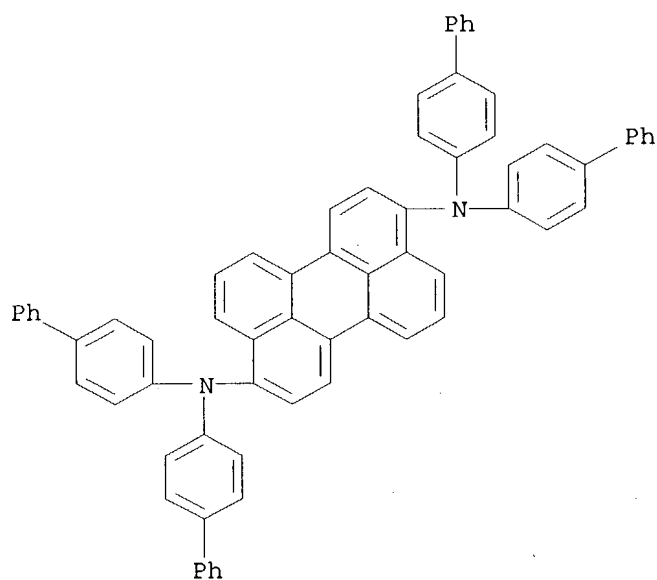
RN 384343-46-8 HCAPLUS  
CN 3,10-Perylenediamine, N,N,N',N'-tetrakis(4-chlorophenyl)- (9CI) (CA INDEX NAME)



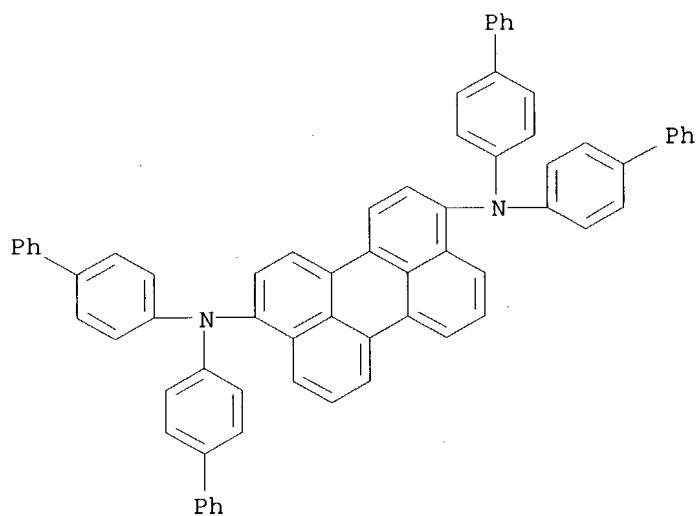
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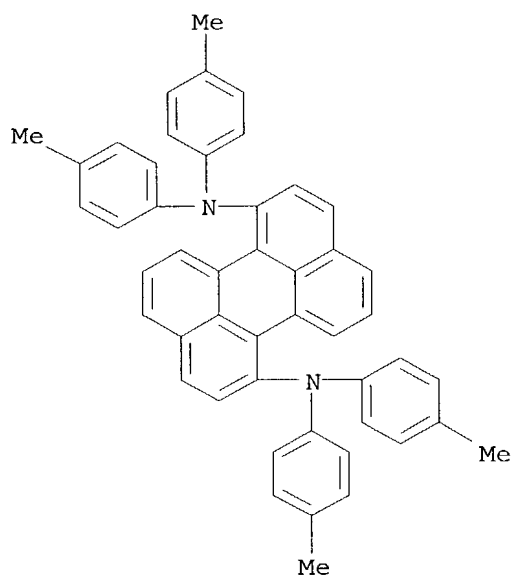
RN 384343-48-0 HCAPLUS  
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 INDEX NAME)



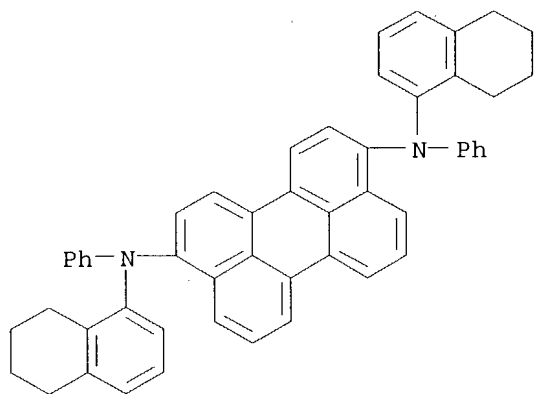
RN 384343-49-1 HCAPLUS  
 CN 3,10-Perylenediamine, N,N,N',N'-tetrakis[1,1'-biphenyl]-4-yl- (9CI) (CA  
 INDEX NAME)



RN 384343-53-7 HCAPLUS  
 CN 1,7-Perylenediamine, N,N,N',N'-tetrakis(4-methylphenyl)- (9CI) (CA INDEX NAME)

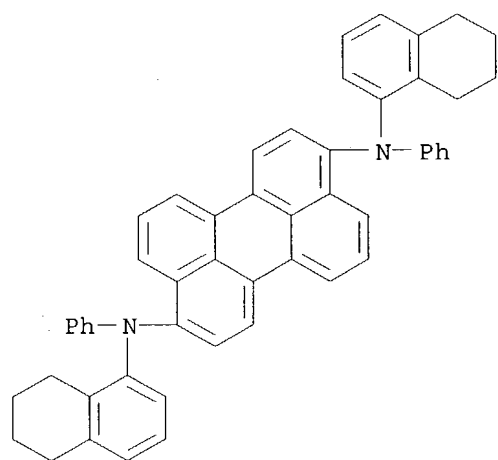


RN 384343-58-2 HCAPLUS  
 CN 3,10-Perylenediamine, N,N'-diphenyl-N,N'-bis(5,6,7,8-tetrahydro-1-naphthalenyl)- (9CI) (CA INDEX NAME)



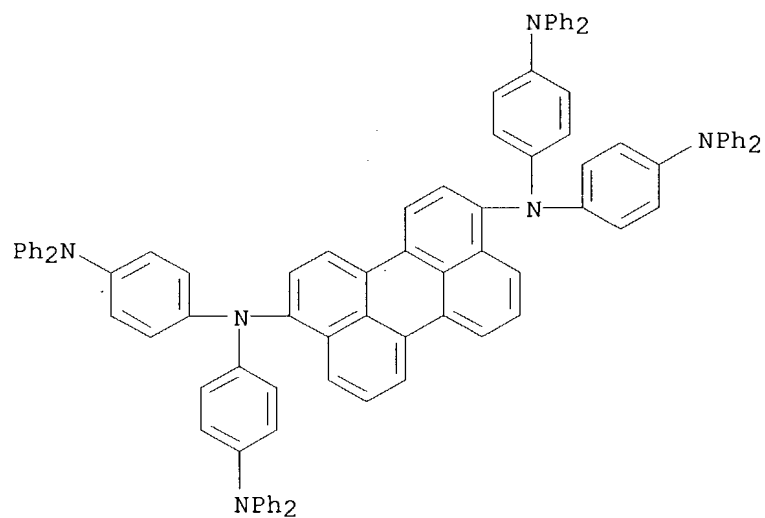
RN 384343-61-7 HCAPLUS

3,9-Perylenediamine, N,N'-diphenyl-N,N'-bis(5,6,7,8-tetrahydro-1-naphthalenyl)- (9CI) (CA INDEX NAME)

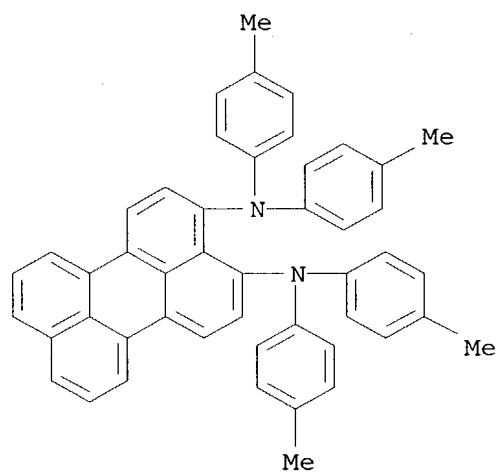


RN 384343-65-1 HCAPLUS

CN 3,10-Perylenediamine, N,N,N',N'-tetrakis[4-(diphenylamino)phenyl]- (9CI)  
(CA INDEX NAME)



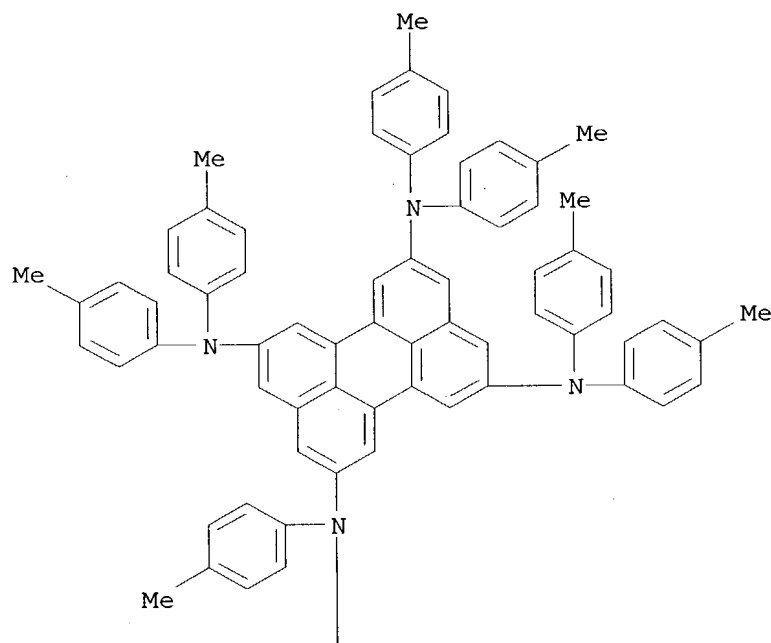
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 CN 3,4-Perylenediamine, N,N,N',N'-tetrakis(4-methylphenyl)- (9CI) (CA INDEX NAME)



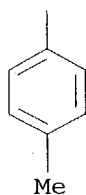
RN 384343-67-3 HCAPLUS  
 CN 2,5,8,11-Perylenetetramine, N,N,N',N',N'',N'',N''',N'''-octakis(4-methylphenyl)- (9CI) (CA INDEX NAME)



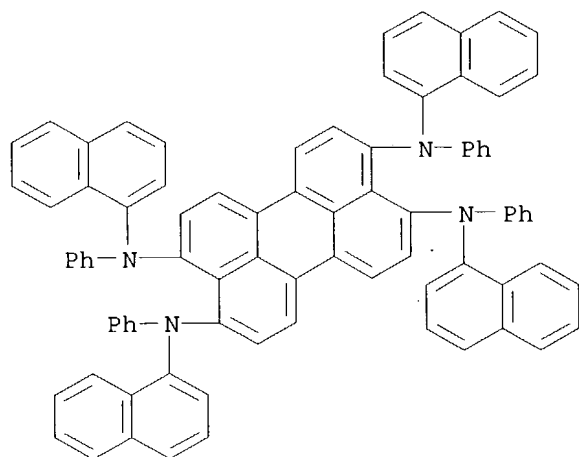
PAGE 1-A



PAGE 2-A

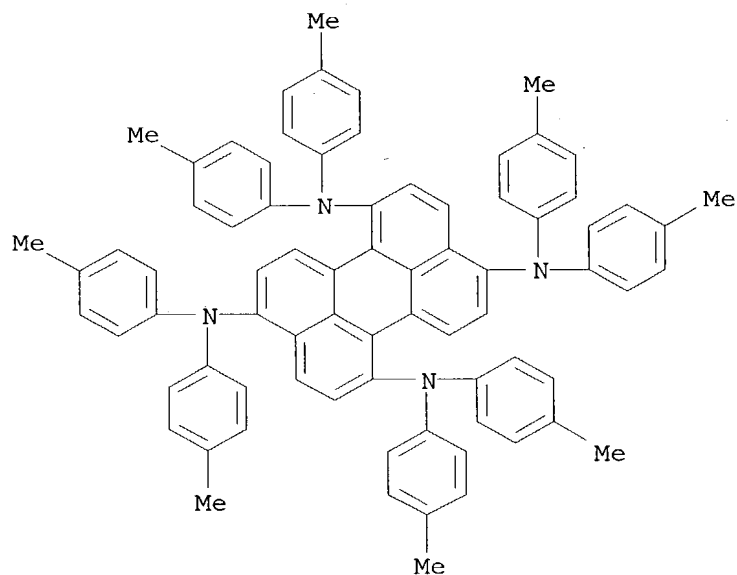


RN 384343-68-4 HCAPLUS  
CN 3,4,9,10-Perylenetetramine, N,N',N'',N'''-tetra-1-naphthalenyl-  
N,N',N'',N'''-tetraphenyl- (9CI) (CA INDEX NAME)



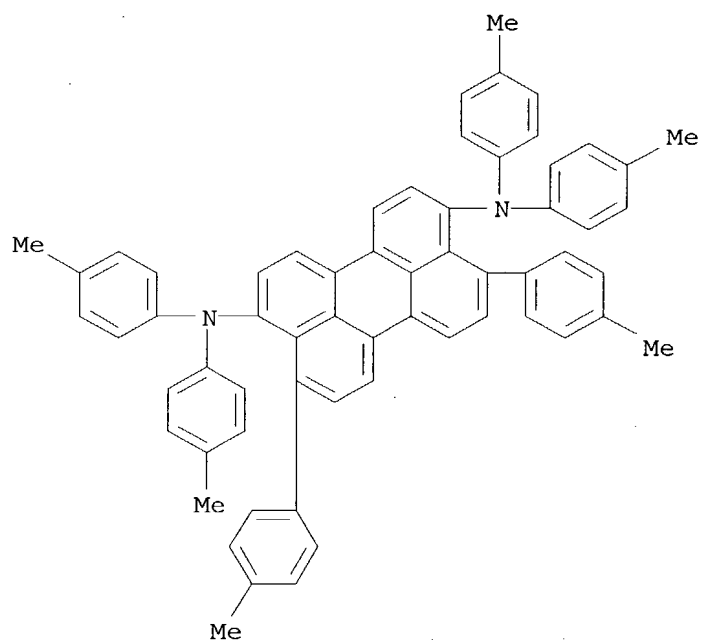
RN 384343-69-5 HCAPLUS

CN 1,4,7,10-Perylenetetramine, N,N,N',N',N'',N'',N''',N'''-octakis(4-methylphenyl)- (9CI) (CA INDEX NAME)



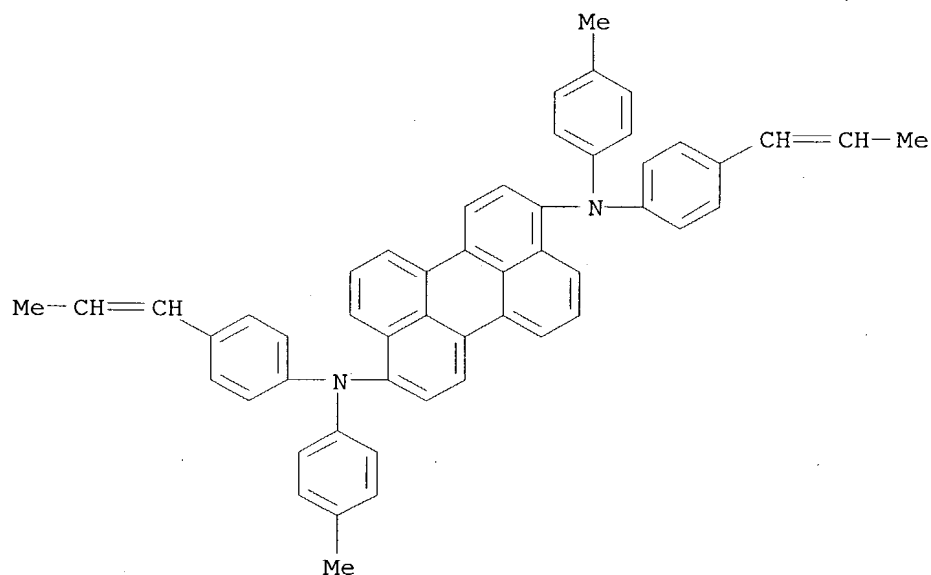
RN 384343-70-8 HCAPLUS

CN 3,10-Perylenediamine, N,N,N',N',4,9-hexakis(4-methylphenyl)- (9CI) (CA INDEX NAME)



RN 384343-72-0 HCAPLUS

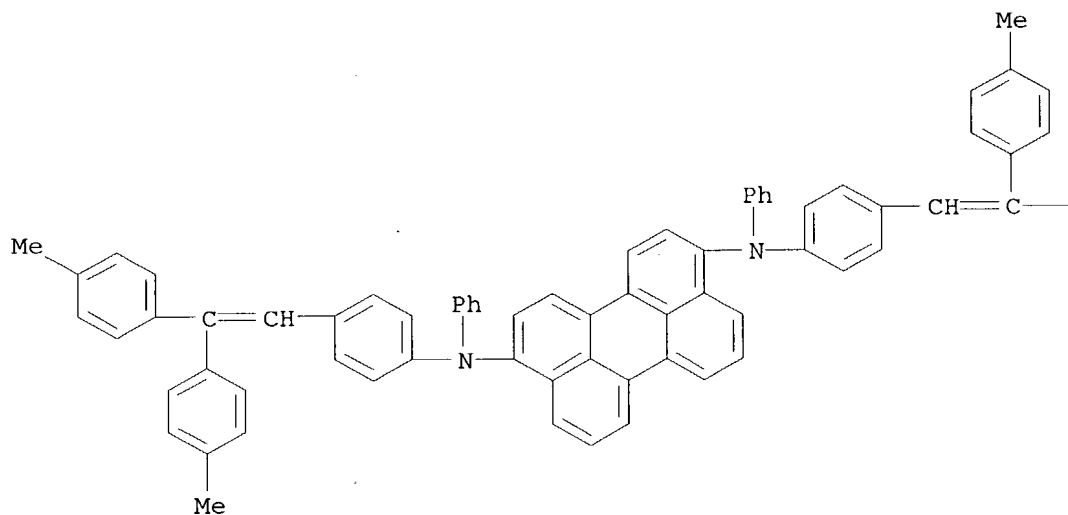
CN 3,9-Perylenediamine, N,N'-bis(4-methylphenyl)-N,N'-bis[4-(1-propenyl)phenyl]- (9CI) (CA INDEX NAME)



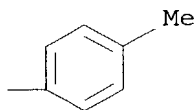
RN 384343-73-1 HCAPLUS

CN 3,10-Perylenediamine, N,N'-bis[4-[2,2-bis(4-methylphenyl)ethenyl]phenyl]-N,N'-diphenyl- (9CI) (CA INDEX NAME)

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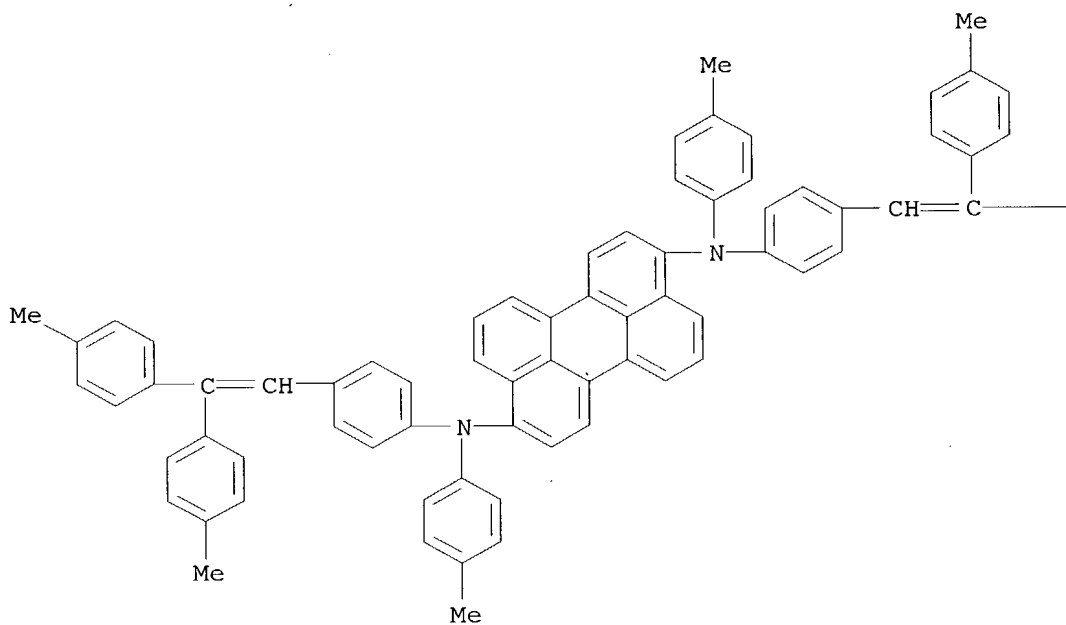


PAGE 1-B

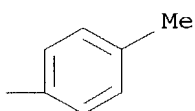


RN 384343-74-2 HCAPLUS  
CN 3,9-Perylenediamine, N,N'-bis[4-[2,2-bis(4-methylphenyl)ethenyl]phenyl]-  
N,N'-bis(4-methylphenyl)- (9CI) (CA INDEX NAME)

PAGE 1-A

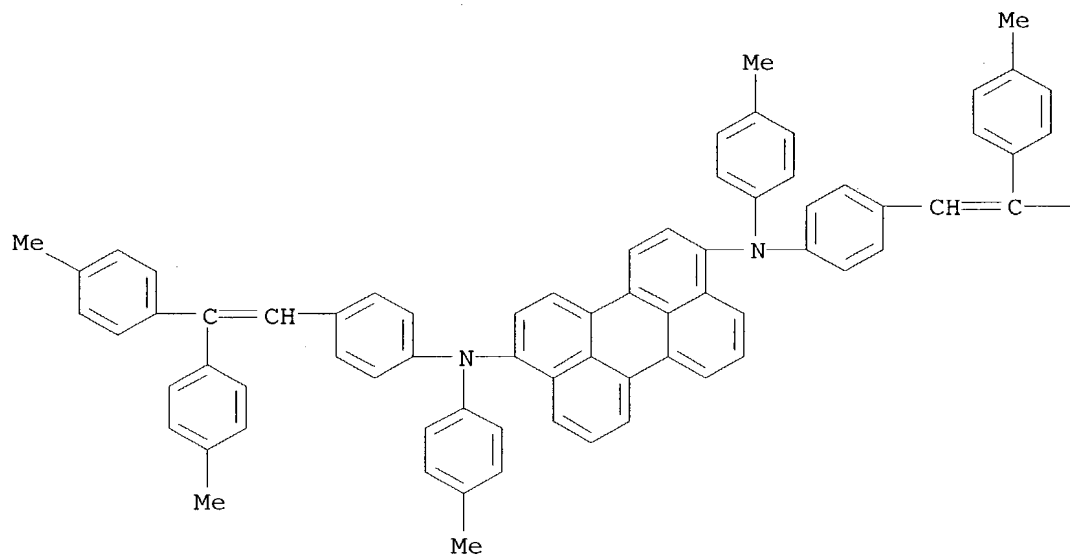


PAGE 1-B

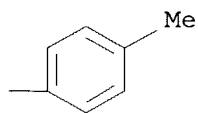


RN 384343-75-3 HCAPLUS  
CN 3,10-Perylenediamine, N,N'-bis[4-[2,2-bis(4-methylphenyl)ethenyl]phenyl]-  
N,N'-bis(4-methylphenyl)- (9CI) (CA INDEX NAME)

PAGE 1-A

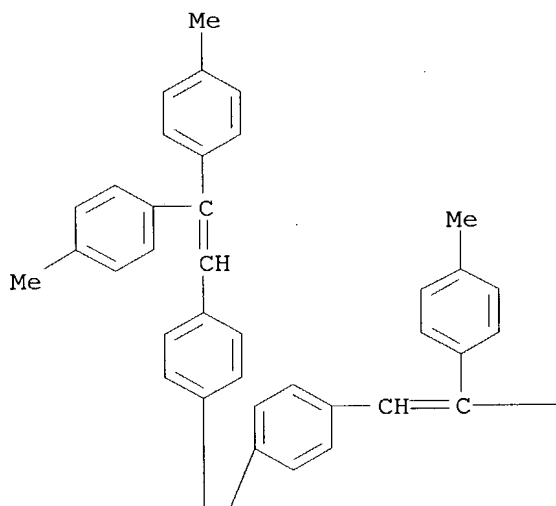


PAGE 1-B

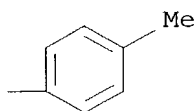


RN 384343-76-4 HCAPLUS  
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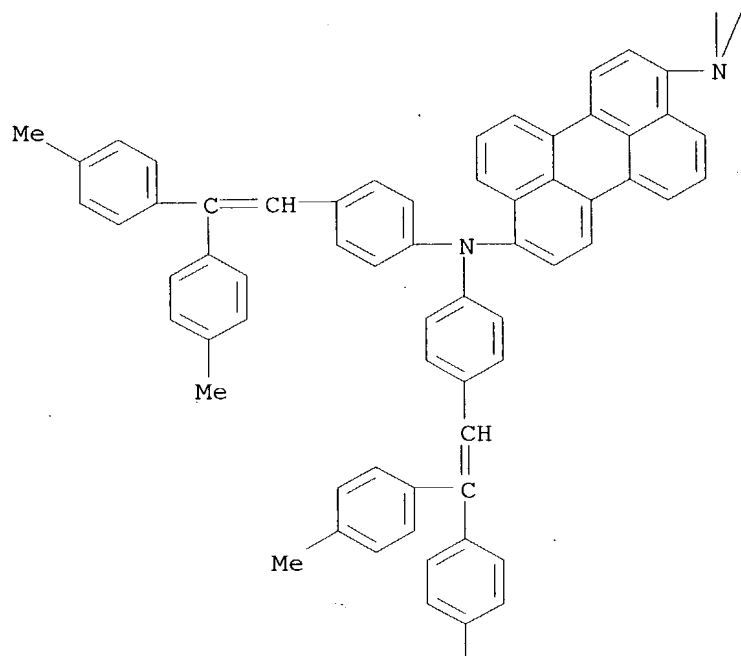
PAGE 1-A



PAGE 1-B



PAGE 2-A



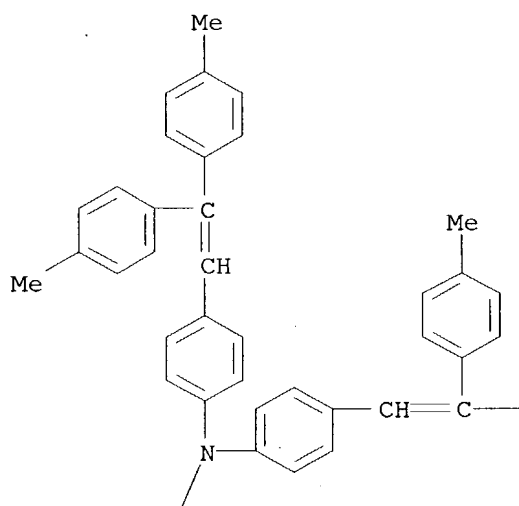
PAGE 3-A

Me

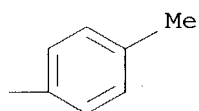
RN 384343-77-5 HCAPLUS  
CN 3,10-Perylenediamine, N,N,N',N'-tetrakis[4-[2,2-bis(4-methylphenyl)ethenyl]phenyl]- (9CI) (CA INDEX NAME)



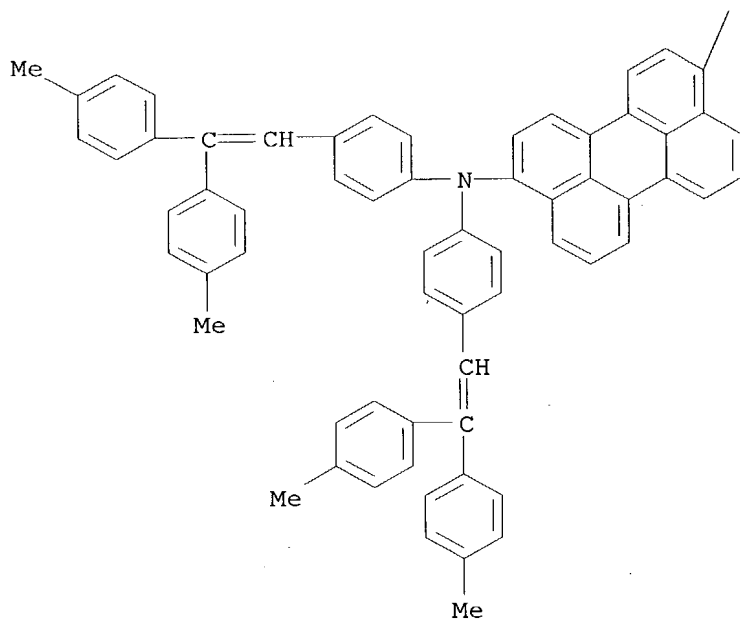
PAGE 1-A



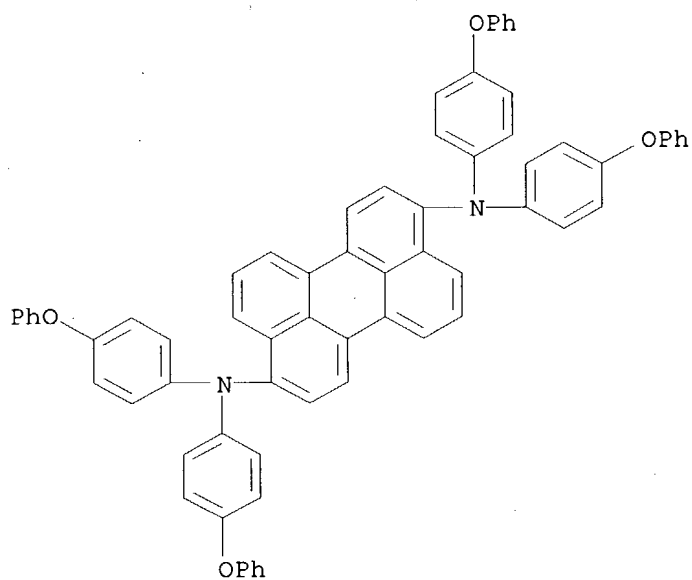
PAGE 1-B



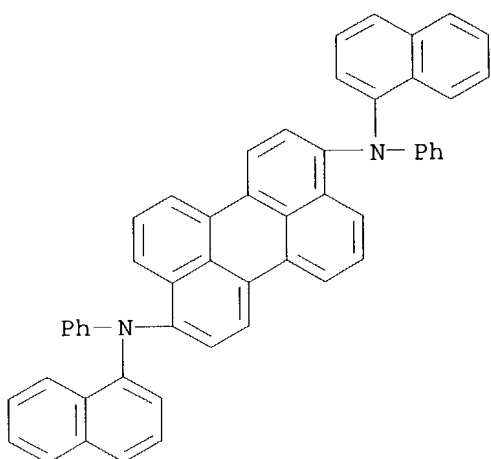
PAGE 2-A



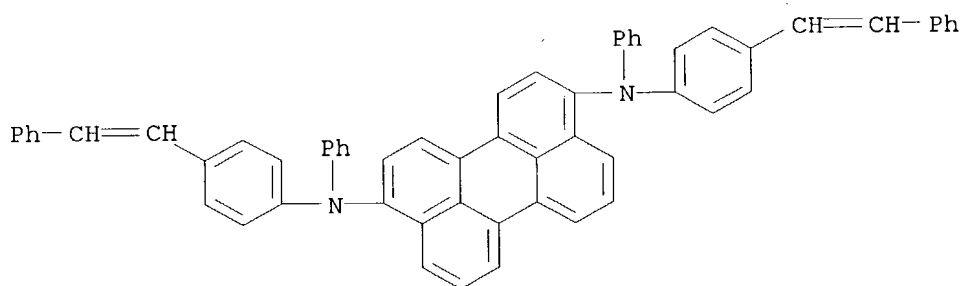
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 CN 3,9-Perylenediamine, N,N,N',N'-tetrakis(4-phenoxyphenyl)- (9CI) (CA INDEX NAME)



RN 384343-98-0 HCAPLUS  
 CN 3,9-Perylenediamine, N,N'-di-1-naphthalenyl-N,N'-diphenyl- (9CI) (CA INDEX NAME)



RN 384343-99-1 HCAPLUS  
 CN 3,10-Perylenediamine, N,N'-diphenyl-N,N'-bis[4-(2-phenylethenyl)phenyl]-  
 (9CI) (CA INDEX NAME)



L47 ANSWER 13 OF 24 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2001:451043 HCAPLUS  
 DN 135:68353  
 TI Organic electroluminescence device  
 IN Morioka, Yukiko; Oda, Atsushi; Ishikawa, Hitoshi; Toguchi, Satoru; Tada, Hiroshi  
 PA NEC Corporation, Japan  
 SO Eur. Pat. Appl., 36 pp.  
 CODEN: EPXXDW  
 DT Patent  
 LA English  
 IC ICM H01L051-20  
 CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)  
 Section cross-reference(s): 76

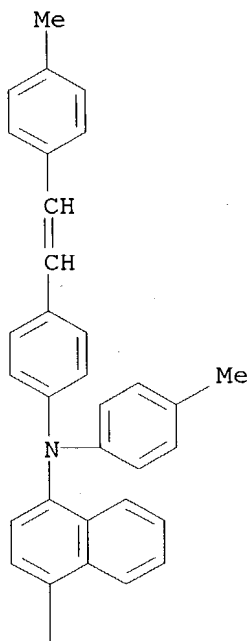
*applicant's*

FAN.CNT 1

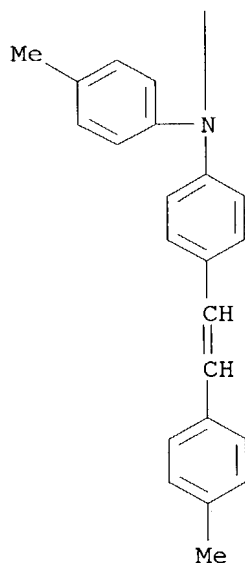
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1109235	A2	20010620	EP 2000-250437	20001215
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
US 2001006742	A1	20010705	US 2000-736519	20001213

JP 2001237078 A2 20010831 JP 2000-380812 20001214  
 PRAI JP 1999-356682 A 19991215  
 OS MARPAT 135:68353  
 AB Org. electroluminescent devices including at least a cathode, a light-emitting zone, and an anode are described in which the **light-emitting** zone comprises a **mixt.** contg. .gtoreq. 2 compds. and the spectrum of the luminescence from light-emitting zone includes .gtoreq.1 peak at a wavelength which is different from any one of fluorescent peak positions of the compds. included in light-emitting zone.  
 ST org **electroluminescent** device luminescent layer **mixt**  
 IT Electroluminescent devices  
 (org.; org. electroluminescent devices with emitting layers employing mixts.)  
 IT 198-55-0, Perylene 15082-28-7 37271-44-6 50926-11-9, ITO 146162-49-4 **221453-37-8 227939-49-3 265120-82-9 282535-70-0**  
 RL: DEV (Device component use); USES (Uses)  
 (org. **electroluminescent** devices with emitting layers employing mixts.)  
 IT **221453-37-8 227939-49-3 265120-82-9 282535-70-0**  
 RL: DEV (Device component use); USES (Uses)  
 (org. **electroluminescent** devices with emitting layers employing mixts.)  
 RN 221453-37-8 HCAPLUS  
 CN 1,4-Naphthalenediamine, N,N'-bis(4-methylphenyl)-N,N'-bis[4-[2-(4-methylphenyl)ethenyl]phenyl]- (9CI) (CA INDEX NAME)

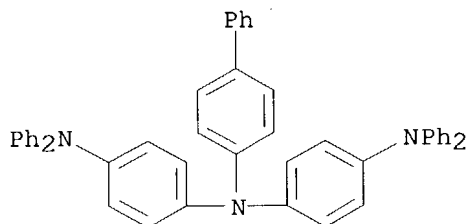
PAGE 1-A



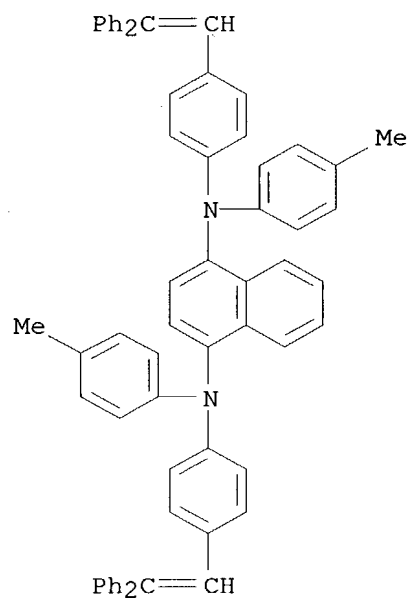
PAGE 2-A



RN 227939-49-3 HCAPLUS  
 CN 1,4-Benzenediamine, N-[1,1'-biphenyl]-4-yl-N-[4-(diphenylamino)phenyl]-  
 N',N'-diphenyl- (9CI) (CA INDEX NAME)



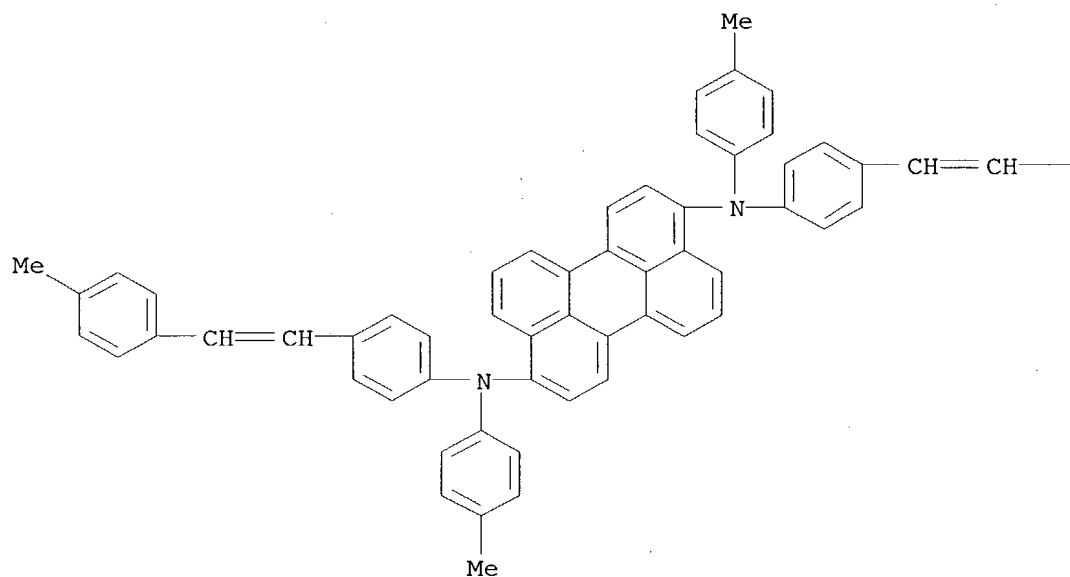
RN 265120-82-9 HCAPLUS  
 CN 1,4-Naphthalenediamine, N,N'-bis[4-(2,2-diphenylethenyl)phenyl]-N,N'-bis(4-  
 methylphenyl)- (9CI) (CA INDEX NAME)



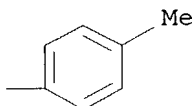
RN 282535-70-0 HCAPLUS

CN 3,9-Perylenediamine, N,N'-bis(4-methylphenyl)-N,N'-bis[4-[2-(4-methylphenyl)ethenyl]phenyl]- (9CI) (CA INDEX NAME)

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PAGE 1-B

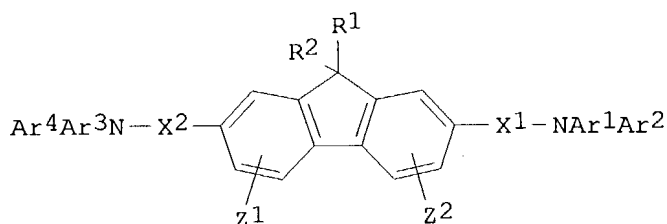


L47 ANSWER 14 OF 24 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2001:106370 HCAPLUS  
 DN 134:172027  
 TI Preparation of 2,7-bis[(bisdiarylamino)aryl]fluorene derivatives as  
 hole-transport materials for organic electroluminescent devices  
 IN Nakatsuka, Masakatsu; Shimamura, Takehiko  
 PA Mitsui Chemicals Inc., Japan  
 SO Jpn. Kokai Tokkyo Koho, 59 pp.  
 CODEN: JKXXAF  
 DT Patent  
 LA Japanese  
 IC ICM C07C211-54  
 ICS C07C211-56; C07C211-58; C07C211-61; C07C217-84; C07C217-90;  
 C07C323-37; C07D209-86; C07D213-74; C07D265-38; C07D279-26;  
 C07D333-36; G03G005-06; H05B033-22

CC 76-14 (Electric Phenomena)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2001039933	A2	20010213	JP 1999-216090	19990730
PRAI	JP 1999-216090		19990730		
OS	MARPAT 134:172027				
GI					



I

AB The title amine compds. [I; Ar1 - Ar4 = (un)substituted aryl; or NAr1Ar2 or NAr3Ar4 forms N-contg. heterocyclyl; R1, R2 = H, linear, branched, or cyclic alkyl, (un)substituted aryl or aralkyl; Z1, Z2 = H, halo, linear, branched, or cyclic alkyl or alkoxy, (un)substituted aryl; X1, X2 = (un)substituted arylene] are prepd. Thus, a **mixt.** of 2,7-bis(4,4,5,5-tetramethyl-1,3,2-dioxaboran-2-yl)-9,9-dimethyl-9H-fluorene, N,N-di(4-methylphenyl)-N-(4-bromophenyl)amine, tetrakis(triphenylphosphine)palladium, K2CO3, PhMe, and water was refluxed for 30 h to give 2,7-bis[4-[bis(4-methylphenyl)amino]phenyl]-9,9-dimethyl-9H-fluorene (II). An electroluminescent device with thin films of II

(hole-transport layer), tris(8-quinolinolato)aluminum (electron transport layer), and magnesium and silver (cathode layer) vapor-deposited in this sequence on an ITO transparent electrode emitted green luminescence at 6.7 V with brightness of 460 sd/m<sup>2</sup> and a half life of 540 h.

ST arylaminoarylfluorene prepn hole transport material org electroluminescent device

IT Phosphors  
(electroluminescent; prepn. of [(bisdiarylamino)aryl]fluorene derivs. as hole-transport materials for org. electroluminescent devices)

IT Electroluminescent devices  
(green-emitting; prepn. of [(bisdiarylamino)aryl]fluorene derivs. as hole-transport materials for org. electroluminescent devices)

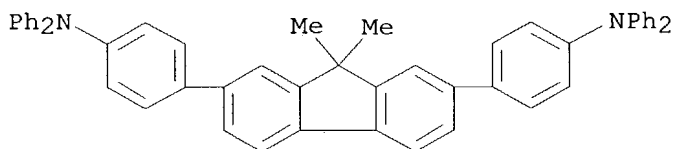
IT **239475-90-2P 239475-91-3P 239475-94-6P**  
**239475-97-9P 239476-00-7P 239476-17-6P 239476-23-4P**  
**239476-24-5P 239476-25-6P 239476-47-2P**  
**325129-38-2P 325129-42-8P 325129-46-2P**  
325129-48-4P 325129-50-8P 325129-52-0P 325129-54-2P  
**325129-57-5P 325129-60-0P 325129-65-5P**  
325129-67-7P  
RL: DEV (Device component use); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
electroluminescent devices)

IT 36809-26-4 57102-42-8 58047-42-0 138310-84-6 202831-64-9  
202831-65-0 204327-05-9 207345-05-9 302579-16-4 302579-18-6  
325129-69-9 325129-74-6 325129-77-9 325129-80-4 325129-83-7  
325129-85-9 325129-92-8 325129-93-9 325129-95-1 325129-97-3  
RL: RCT (Reactant); RACT (Reactant or reagent)  


IT **239475-90-2P 239475-91-3P 239475-94-6P**  
**239475-97-9P 239476-17-6P 239476-24-5P**  
**239476-25-6P 325129-38-2P 325129-42-8P**  
**325129-46-2P 325129-57-5P 325129-60-0P**  
**325129-65-5P**  
RL: DEV (Device component use); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
electroluminescent devices)

RN 239475-90-2 HCAPLUS

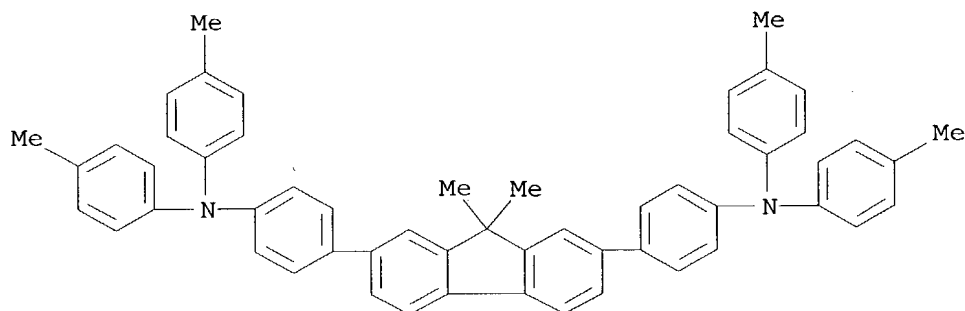
CN Benzenamine, 4,4'-(9,9-dimethyl-9H-fluorene-2,7-diyl)bis[N,N-diphenyl- (9CI) (CA INDEX NAME)



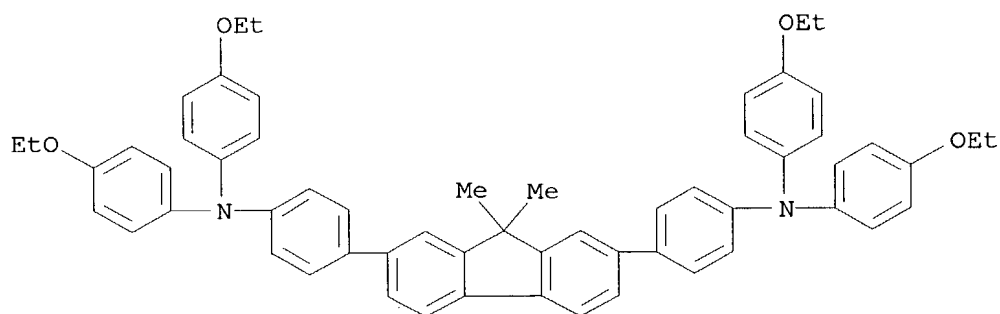
RN 239475-91-3 HCAPLUS

CN Benzenamine, 4,4'-(9,9-dimethyl-9H-fluorene-2,7-diyl)bis[N,N-bis(4-methylphenyl)- (9CI) (CA INDEX NAME)

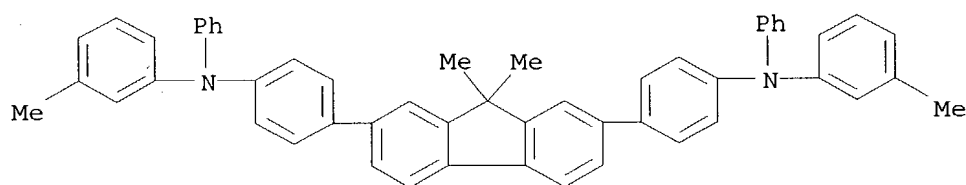




RN 239475-94-6 HCAPLUS  
 CN Benzenamine, 4,4'-(9,9-dimethyl-9H-fluorene-2,7-diyl)bis[N,N-bis(4-ethoxyphenyl)- (9CI) (CA INDEX NAME)

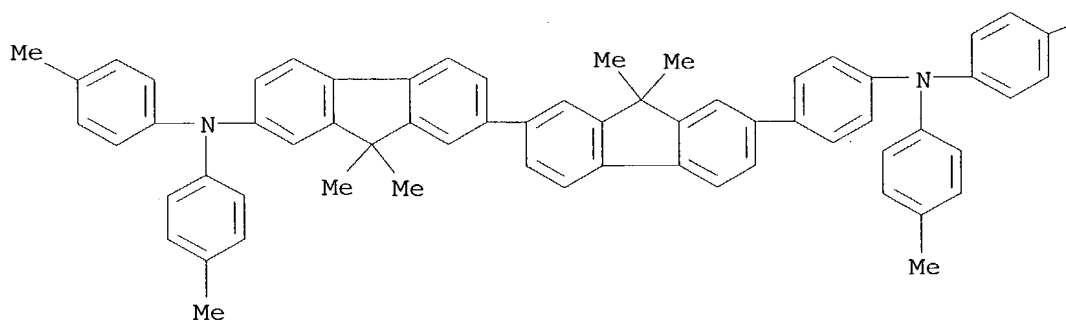


RN 239475-97-9 HCAPLUS  
 CN Benzenamine, 4,4'-(9,9-dimethyl-9H-fluorene-2,7-diyl)bis[N-(3-methylphenyl)-N-phenyl- (9CI) (CA INDEX NAME)



RN 239476-17-6 HCAPLUS  
 CN [2,2'-Bi-9H-fluoren]-7-amine, 7'-[4-[bis(4-methylphenyl)amino]phenyl]-9,9,9',9'-tetramethyl-N,N-bis(4-methylphenyl)- (9CI) (CA INDEX NAME)

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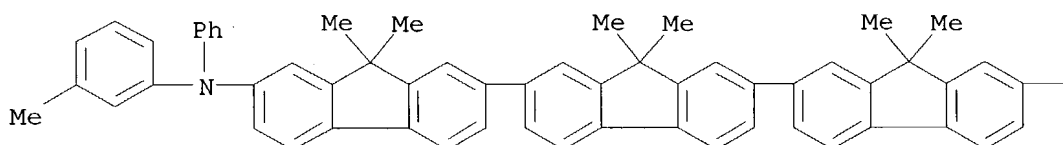


PAGE 1-B

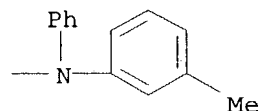
Me

RN 239476-24-5 HCAPLUS  
 CN [2,2':7',2''-Ter-9H-fluorene]-7,7''-diamine, 9,9,9',9',9'',9''-hexamethyl-N,N'-bis(3-methylphenyl)-N,N'-diphenyl- (9CI) (CA INDEX NAME)

PAGE 1-A

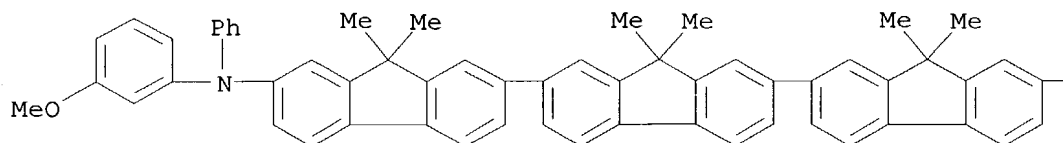


PAGE 1-B

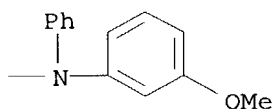


RN 239476-25-6 HCAPLUS  
 CN [2,2':7',2''-Ter-9H-fluorene]-7,7''-diamine, N,N'-bis(3-methoxyphenyl)-9,9,9',9',9'',9''-hexamethyl-N,N'-diphenyl- (9CI) (CA INDEX NAME)

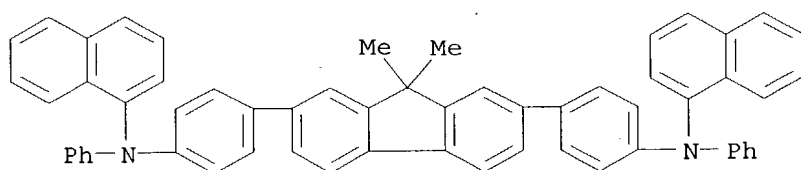
PAGE 1-A



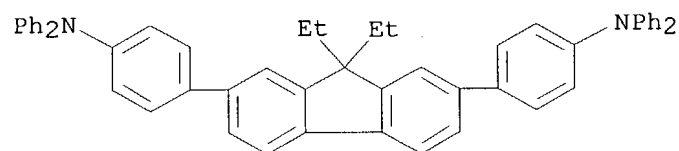
PAGE 1-B



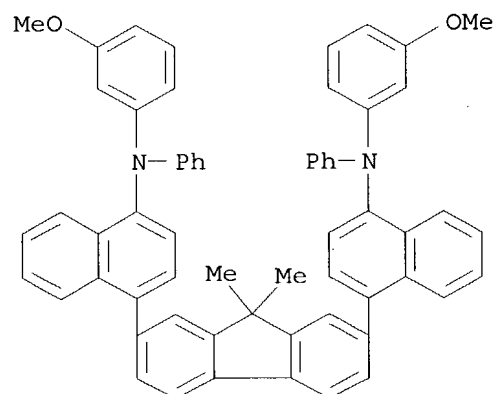
RN 325129-38-2 HCAPLUS  
 CN 1-Naphthalenamine, N,N'-[(9,9-dimethyl-9H-fluorene-2,7-diyl)di-4,1-phenylene]bis[N-phenyl- (9CI) (CA INDEX NAME)]



RN 325129-42-8 HCAPLUS  
 CN Benzenamine, 4,4'-(9,9-diethyl-9H-fluorene-2,7-diyl)bis[N,N-diphenyl- (9CI) (CA INDEX NAME)]

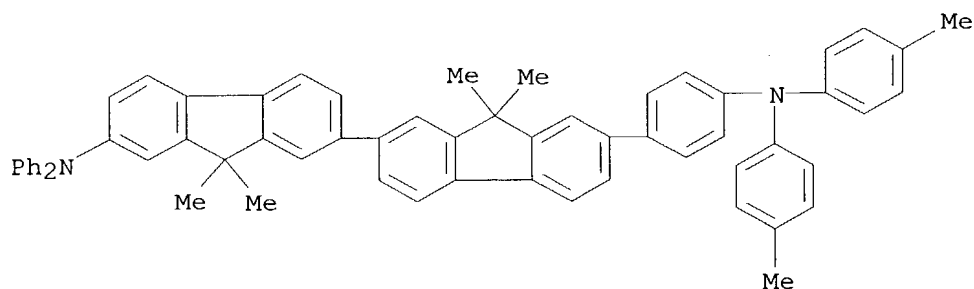


RN 325129-46-2 HCAPLUS  
 CN 1-Naphthalenamine, 4,4'-(9,9-dimethyl-9H-fluorene-2,7-diyl)bis[N-(3-methoxyphenyl)-N-phenyl- (9CI) (CA INDEX NAME)]



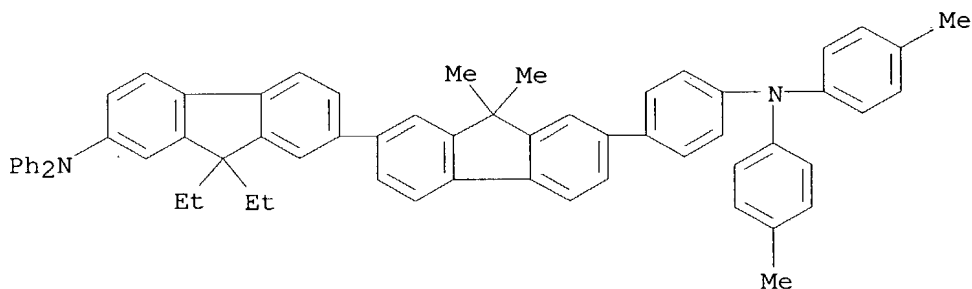
RN 325129-57-5 HCAPLUS  
 CN [2,2'-Bi-9H-fluoren]-7-amine, 7'-[4-[bis(4-methylphenyl)amino]phenyl]-

9,9,9',9'-tetramethyl-N,N-diphenyl- (9CI) (CA INDEX NAME)



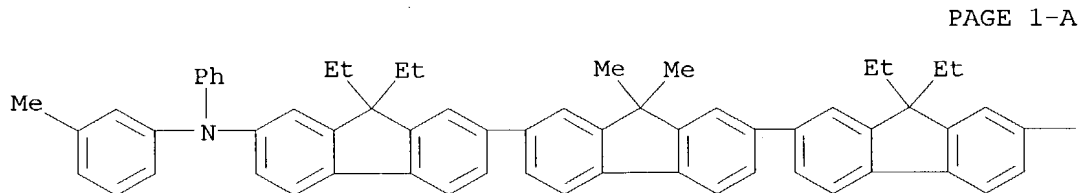
RN 325129-60-0 HCAPLUS

CN [2,2'-Bi-9H-fluorene]-7-amine, 7'-[4-[bis(4-methylphenyl)amino]phenyl]-9,9-dimethyl-9',9'-dimethyl-N,N-diphenyl- (9CI) (CA INDEX NAME)

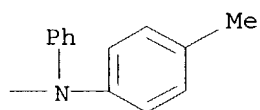


RN 325129-65-5 HCAPLUS

CN [2,2':7',2''-Ter-9H-fluorene]-7,7''-diamine, 9,9,9'',9''-tetraethyl-9',9'-dimethyl-N-(3-methylphenyl)-N'-(4-methylphenyl)-N,N'-diphenyl- (9CI) (CA INDEX NAME)



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L47 ANSWER 15 OF 24 HCAPLUS COPYRIGHT 2003 ACS on STN  
AN 2000:739330 HCAPLUS

KATHLEEN FULLER EIC 1700/PARKER LAW 308-4290

DN 134:138592  
 TI Physics of organic alloy light-emitting diodes  
 AU Shen, Jun; Choong, Vi-En; Yang, Jie; Shi, Song; So, Franky  
 CS Department of Electrical Engineering and Center for Solid State  
 Electronics Research, Arizona State University, Tempe, AZ, 85287, USA  
 SO Proceedings of SPIE-The International Society for Optical Engineering  
 (2000), 3939(Organic Photonic Materials and Devices II), 181-188  
 CODEN: PSISDG; ISSN: 0277-786X  
 PB SPIE-The International Society for Optical Engineering  
 DT Journal  
 LA English  
 CC 73-5 (**Optical**, Electron, and Mass Spectroscopy and Other Related  
 Properties)  
 Section cross-reference(s): 76  
 AB Theor. models and exptl. results on the carrier transport mechanisms in  
 single-layer org. alloy light emitting diodes are presented. The typical  
 org. alloy consists of a **mixt.** of electron and hole transporting  
 materials. The **device** shows significant improvement in lifetime  
 at room and elevated temps. The improvement is attributed to the  
 elimination of the heterointerface and the minimization of the formation  
 of unstable tris-(8-hydroxyquinoline) aluminum (Alq3) cations. The  
 efficiency is comparable to those of their heterojunction counterparts.  
 Balanced bipolar carrier injection and transport are made possible by  
 adjusting the alloy compn. and doping. The authors model the  
**device** by assigning individual conduction channels to each type of  
 material. The sensitivity of the diode efficiency on several key  
 parameters is studied.  
 ST org light emitting diode carrier transport model; OLED electron hole  
 transport electroluminescence  
 IT HOMO (molecular orbital)  
 LUMO (molecular orbital)  
 (carrier mobility and recombination processes in HOMO and LUMO orbitals  
 of NPB and Alq3 mixed-layer light-emitting diode)  
 IT Electron-hole recombination  
 (carrier transport and recombination processes in org. mixed-layer  
**light-emitting** diode and effect of **mixt.**  
 compn. on)  
 IT Electric current-potential relationship  
 (current-voltage, luminance-voltage and efficiency-voltage  
 characteristics of mixed-layer OLED and heterojunction OLED)  
 IT Luminescence, electroluminescence  
 (in mixed-layer org. light-emitting diode)  
 IT Solid-solid interface  
 (increase in operating lifetime of mixed-layer OLED compared with  
 heterojunction LED due to elimination of heterojunction interface)  
 IT Electroluminescent **devices**  
 (physics of mixed-layer org. light-emitting diode)  
 IT Electric current carriers  
 (transport, and mobility; in mixed-layer org. light-emitting diode)  
 IT Doping  
 (voltage, luminance and efficiency of mixed-layer org. light-emitting  
 diode as function of doping coverage)  
 IT 2085-33-8, Alq3  
 RL: **DEV (Device component use)**; PEP (Physical, engineering or  
 chemical process); PROC (Process); USES (Uses)  
 (electron-transporting and emitting material; **mixt.**  
 single-layer **light-emitting** diode contg. Alq3 and  
 NPB)

IT 123847-85-8, NPB

RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)  
 (hole-transporting material; **mixt.** single-layer **light**  
**-emitting** diode contg. Alq3 and NPB)

RE.CNT 35 THERE ARE 35 CITED REFERENCES AVAILABLE FOR THIS RECORD  
 RE

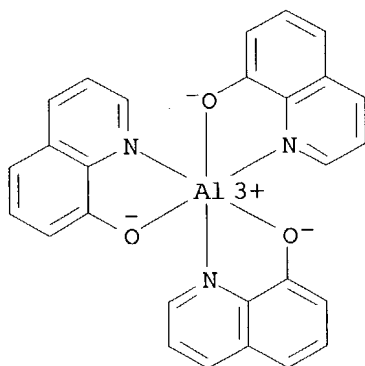
- (1) Albrecht, U; Phys Stat Sol (b) 1995, V191, P455 HCAPLUS
- (2) Anon; US 5853905 HCAPLUS
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- (34) Yang, J; submitted to J Appl Phys
- (35) Yang, J; unpublished

IT 2085-33-8, Alq3

RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)  
 (electron-transporting and emitting material; **mixt.**  
 single-layer **light-emitting** diode contg. Alq3 and  
 NPB)

RN 2085-33-8 HCAPLUS

CN Aluminum, tris(8-quinolinolato-.kappa.N1,.kappa.O8)- (9CI) (CA INDEX  
 NAME)

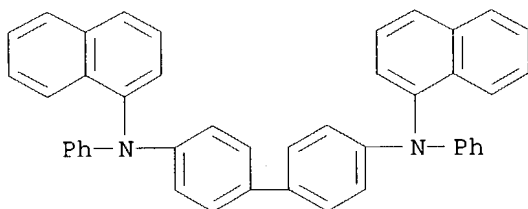


IT 123847-85-8, NPB

RL: **DEV (Device component use)**; PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)  
 (hole-transporting material; **mixt.** single-layer **light**  
**-emitting** diode contg. Alq3 and NPB)

RN 123847-85-8 HCAPLUS

CN [1,1'-Biphenyl]-4,4'-diamine, N,N'-di-1-naphthalenyl-N,N'-diphenyl- (9CI)  
 (CA INDEX NAME)



L47 ANSWER 16 OF 24 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 2000:612657 HCAPLUS

DN 133:185304

TI Organic light emitters using active material blends

IN Burroughes, Jeremy Henley; Hughes, Peter William

PA Cambridge Display Technology Limited, UK

SO Brit. UK Pat. Appl., 30 pp.

CODEN: BAXXDU

DT Patent

LA English

IC ICM H01L051-20

ICS H05B033-14

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

Section cross-reference(s): 38

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	GB 2340304	A1	20000216	GB 1998-18376	19980821
PRAI	GB 1998-18376		19980821		

AB Light-emitting devices are described which comprise a first charge carrier injecting layer for injecting pos. charge carriers; a second charge

carrier injecting layer for injecting neg. charge carriers; and a light-emitting layer located between the charge carrier injecting layers and comprising a **mixt.** of at least **two electroluminescent** org. materials, the relative proportions of the the org. materials in the light-emitting layer influencing the emission color of the light-emitting layer. Methods for tailoring the emission color of a light-emitting material are described which entail mixing a first electroluminescent org. material with a second electroluminescent org. material in a ratio so as to achieve the desired emission color.

ST org light emitting device active material blend; color control active material blending light emitting device

IT Polymer blends  
 RL: DEV (Device component use); USES (Uses)  
 (org. light-emitting devices with active layers formed from blends for emission color control)

IT Electroluminescent devices  
 (org.; org. light-emitting devices with active layers formed from blends for emission color control)

IT 2530-83-8  
 RL: DEV (Device component use); USES (Uses)  
 (org. light-emitting devices with active layers formed from blends for emission color control)

IT 198-55-0, Perylene 123863-98-9 123864-00-6 166534-30-1, MEH-CN-PPV  
**223569-29-7** 288263-28-5 **288263-79-6** 288263-89-8  
**288263-90-1** 288264-02-8  
 RL: DEV (Device component use); POF (Polymer in formulation); USES (Uses)  
 (org. **light-emitting** devices with active layers formed from blends for emission color control)

IT 50851-57-5  
 RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)  
 (polyethylene dioxythiophene doped with; org. light-emitting devices with active layers formed from blends for emission color control)

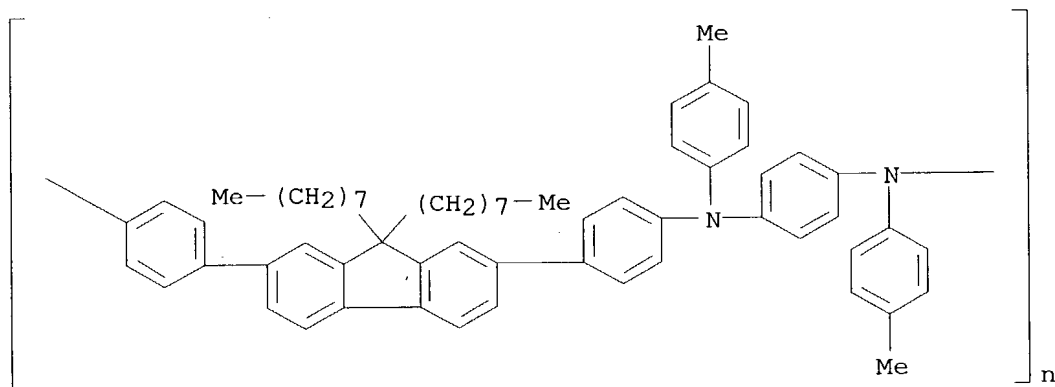
IT 126213-51-2  
 RL: DEV (Device component use); USES (Uses)  
 (polystyrene sulfonate-doped; org. light-emitting devices with active layers formed from blends for emission color control)

IT **223569-29-7 288263-79-6 288263-90-1**  
 RL: DEV (Device component use); POF (Polymer in formulation); USES (Uses)  
 (org. **light-emitting** devices with active layers formed from blends for emission color control)

RN 223569-29-7 HCAPLUS

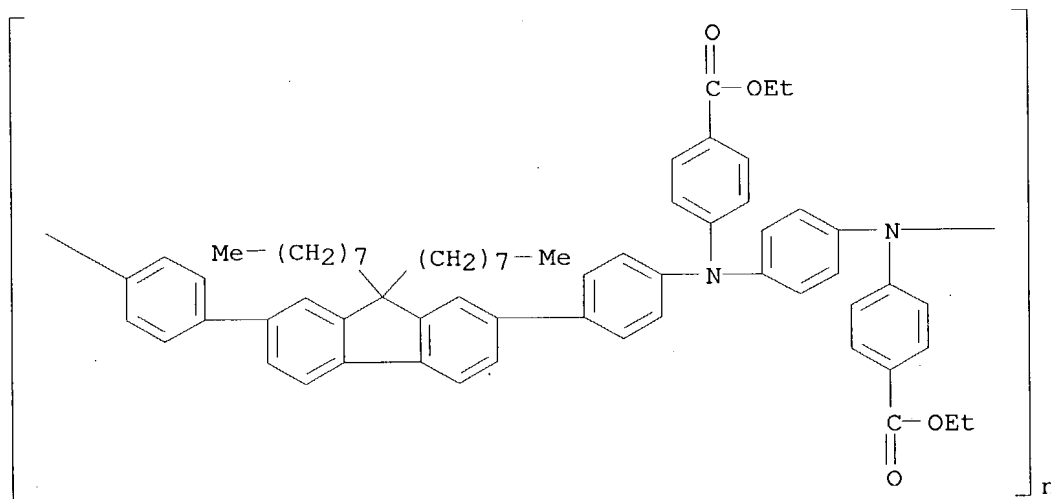
CN Poly[[(4-methylphenyl)imino]-1,4-phenylene[(4-methylphenyl)imino]-1,4-phenylene(9,9-dioctyl-9H-fluorene-2,7-diyl)-1,4-phenylene] (9CI) (CA INDEX NAME)





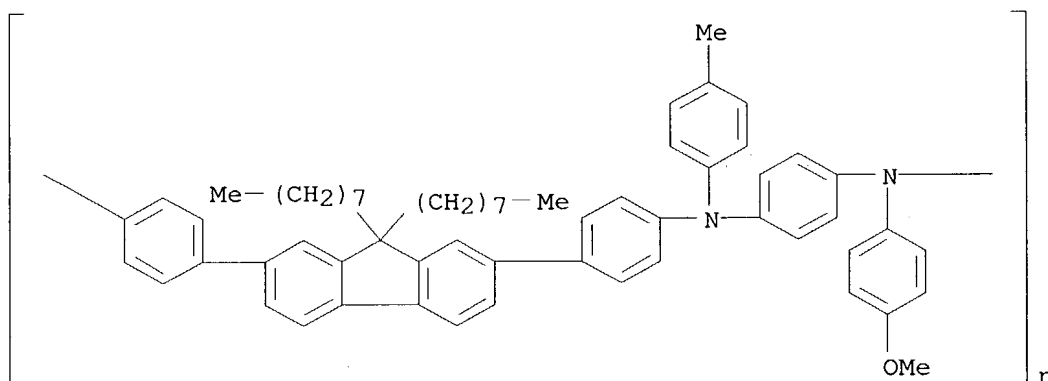
RN 288263-79-6 HCAPLUS

CN Poly[[[4-(ethoxycarbonyl)phenyl]imino]-1,4-phenylene[[4-(ethoxycarbonyl)phenyl]imino]-1,4-phenylene(9,9-dioctyl-9H-fluorene-2,7-diyl)-1,4-phenylene] (9CI) (CA INDEX NAME)



RN 288263-90-1 HCAPLUS

CN Poly[[[4-methoxyphenyl]imino]-1,4-phenylene[(4-methylphenyl)imino]-1,4-phenylene(9,9-dioctyl-9H-fluorene-2,7-diyl)-1,4-phenylene] (9CI) (CA INDEX NAME)



L47 ANSWER 17 OF 24 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2000:271719 HCAPLUS  
 DN 132:327300  
 TI Exciplex formation at the organic solid/solid interface and tuning of the emission color in organic electroluminescent devices  
 AU Okumoto, K.; Shirota, Y.  
 CS Faculty of Engineering, Department of Applied Chemistry, Osaka University, Suita, Osaka, Japan  
 SO Journal of Luminescence (2000), 87-89, 1171-1173  
 CODEN: JLUMA8; ISSN: 0022-2313  
 PB Elsevier Science B.V.  
 DT Journal  
 LA English  
 CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)  
 Section cross-reference(s): 22, 76  
 AB Exciplex formation at the org. solid/solid interface between tris(quinolin-8-olato)aluminum (Alq3) and 4,4',4''-tris[2-naphthyl(phenyl)amino]triphenylamine (2-TNATA) and its application to color tuning in org. electroluminescent devices were studied. The exciplex formation was evidenced by the measurements of the luminescence and fluorescence lifetime of the solid film of an equimolar **mixt.** of Alq3 and 2-TNATA. The emission color of a new triple-layer org. electroluminescent device with a thin layer of an equimolar **mixt.** of Alq3 and 2-TNATA in between 2-TNATA and Alq3 layers can be tuned from yellow to green by varying the applied voltage.  
 ST exciplex org solid interface tuning emission color electroluminescent device  
 IT Electroluminescent devices  
 (exciplex formation at org. solid/solid interface and tuning of emission color in org.)  
 IT Solid-solid interface  
 (exciplex formation in org. electroluminescent devices at)  
 IT Exciplex  
 (formation at org. solid/solid interface in org. electroluminescent devices)  
 IT 2085-33-8, Tris(quinolin-8-olato)aluminum **185690-41-9**, 4,4',4''-Tris[2-naphthyl(phenyl)amino]triphenylamine  
 RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)

(exciplex formation at org. solid/solid interface and tuning of emission color in org. **electroluminescent** devices contg.)

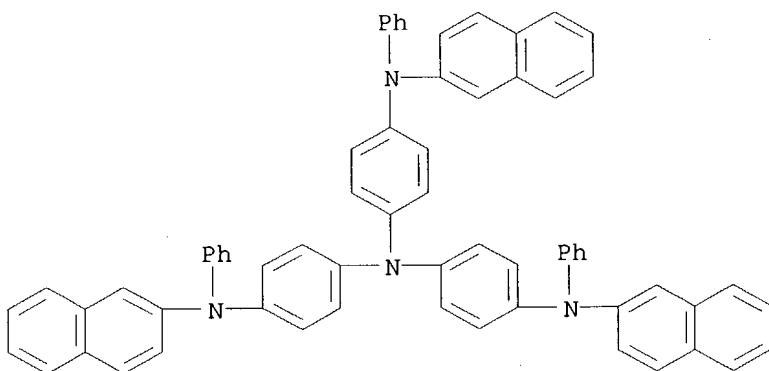
RE.CNT 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD  
RE

- (1) Burroughes, J; Nature 1990, V347, P539 HCAPLUS
- (2) Itano, K; Appl Phys Lett 1998, V72, P636 HCAPLUS
- (3) Ogawa, H; Appl Phys A 1998, V67, P599
- (4) Shirota, Y; Appl Phys Lett 1994, V65, P807 HCAPLUS
- (5) Shirota, Y; Chem Lett 1989, P1145 HCAPLUS
- (6) Shirota, Y; J Lumin 1997, V72, P985
- (7) Shirota, Y; Proc SPIE-Int Soc Opt Eng 1997, V3148, P720
- (8) Tang, C; Appl Phys Lett 1987, V51, P913 HCAPLUS

IT **185690-41-9**, 4,4',4''-Tris[2-naphthyl(phenyl)amino]triphenylamine  
 RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)  
 (exciplex formation at org. solid/solid interface and tuning of emission color in org. **electroluminescent** devices contg.)

RN 185690-41-9 HCAPLUS

CN 1,4-Benzenediamine, N-2-naphthalenyl-N',N'-bis[4-(2-naphthalenylphenylamino)phenyl]-N-phenyl- (9CI) (CA INDEX NAME)



L47 ANSWER 18 OF 24 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 1999:747428 HCAPLUS

DN 131:358224

TI Preparation of aromatic tertiary amine compounds possessing nitrogen-containing 7-member ring structure

IN Sato, Tadahisa

PA Fuji Photo Film Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 9 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM C07D223-14

ICS C07D223-24; C07D223-26; C09K011-06; G03G005-06

CC 74-3 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 11322719	A2	19991124	JP 1998-129335	19980512
PRAI	JP 1998-129335		19980512		

OS MARPAT 131:358224

GI

\* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT \*

AB The title dibenzazepine compds. (I; A, B = ethylene, CH:CH, o-arylene; R1 - R9 = H, halo, alkyl, aryl, alkoxy, aryloxy, dialkylamino, N-alkyl-N-aryl amino, diarylamino; m, n, q = 1-4; p = 0-2) are prep'd. These compds. exhibit high m.p. and glass transition temp. and high stability against phys., optical, and electrochem. changes and are useful as hole transport materials for electroluminescence materials or carrier transport materials for electrophotog. materials (no data). They form a stable amorphous thin film in large area by vapor deposition which is excellent in thermal stability due to high m.p. and glass transition temp. and enables one to design org. electroluminescent device with long-lasting luminescence. Thus, 5H-dibenz[b,f]azepine, 1,4-dibromobenzene, KOH, and Cu powder were mixed with decaline and heated at 200.degree. for 40 h to give 25% 5-(4-bromophenyl)-5H-dibenz[b,f]azepine which was treated with BuLi in hexane at -78.degree., condensed with tri-Me borate, and subjected to hydrolysis with dil. aq. HCl to give a crude boronic acid. The latter comp'd. was coupled with 4,4'-dibromotriphenylamine in the presence of (PPh3)4Pd in a **mixt.** of toluene and 2 M aq. NaOH under reflux for .apprx.10 h to give the title comp'd. (II) (m.p. .apprx.275.degree.).

ST arom tertiary amine comp'd prepn; dibenzazepine prepn electroluminescent material; electrophotog material tribenzazepine 312

IT Phosphors

(electroluminescent; prepn. of arom. tertiary amine compds. possessing nitrogen-contg. 7-member ring structure as electroluminescence or electrophotog. materials)

IT Electrophotographic photoconductors (photoreceptors)

(prepn. of arom. tertiary amine compds. possessing nitrogen-contg. 7-member ring structure as electroluminescence or electrophotog. materials)

IT 106-37-6, 1,4-Dibromobenzene 256-96-2, 5H-Dibenzo[b,f]azepine  
531-91-9, N,N'-Diphenylbenzidine 3001-15-8, 4,4'-Diiodobiphenyl  
29875-73-8, 9H-Tribenzo[b,d,f]azepine 81090-53-1, 4,4'-  
Dibromotriphenylamine

RL: RCT (Reactant); RACT (Reactant or reagent)

(prepn. of arom. tertiary amine compds. possessing nitrogen-contg. 7-member ring structure as electroluminescence or electrophotog. materials)

IT 204200-15-7P, 5-(4'-Iodo-1,1'-biphenyl-4-yl)-5H-dibenzo[b,f]azepine  
204200-17-9P, 9-(4'-Iodo-1,1'-biphenyl-4-yl)-9H-tribenzo[b,d,f]azepine  
212385-54-1P, 5-(4-Bromophenyl)-5H-dibenzo[b,f]azepine 218272-57-2P,  
9-(4-Bromophenyl)-9H-tribenzo[b,d,f]azepine

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(prepn. of arom. tertiary amine compds. possessing nitrogen-contg. 7-member ring structure as electroluminescence or electrophotog. materials)

IT 250606-99-6P 250607-00-2P **250607-01-3P 250607-02-4P**

RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(prepn. of arom. tertiary amine compds. possessing nitrogen-contg.

7-member ring structure as **electroluminescence** or electrophotog. materials)

IT 250607-01-3P 250607-02-4P

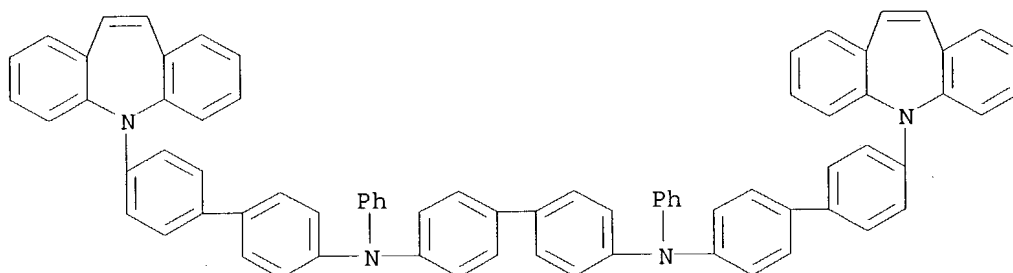
RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(prepn. of arom. tertiary amine compds. possessing nitrogen-contg.

7-member ring structure as **electroluminescence** or electrophotog. materials).

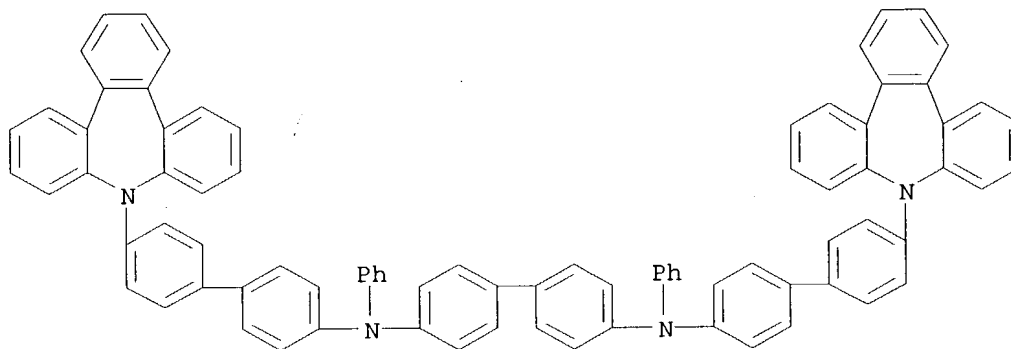
RN 250607-01-3 HCAPLUS

CN [1,1'-Biphenyl]-4,4'-diamine, N,N'-bis[4'-(5H-dibenz[b,f]azepin-5-yl)[1,1'-biphenyl]-4-yl]-N,N'-diphenyl- (9CI) (CA INDEX NAME)



RN 250607-02-4 HCAPLUS

CN [1,1'-Biphenyl]-4,4'-diamine, N,N'-diphenyl-N,N'-bis[4'-(9H-tribenz[b,d,f]azepin-9-yl)[1,1'-biphenyl]-4-yl]- (9CI) (CA INDEX NAME)



L47 ANSWER 19 OF 24 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 1999:708076 HCAPLUS

DN 131:329656

TI Organic EL **devices**

IN Arai, Michio

PA TDK Electronics Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 9 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM H05B033-22

ICS H05B033-14

CC 73-11 (**Optical**, Electron, and Mass Spectroscopy and Other

## Related Properties)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 11307259	A2	19991105	JP 1998-129593	19980423
PRAI	JP 1998-129593		19980423		

AB The **devices** comprise .gtoreq.1 org. light-emitting layer(s) sandwiched between a hole-injecting electrode and an electron-injecting electrode, with an inorg. hole-injecting layer formed in between the org. layer and the hole-injecting electrode. The hole-injecting layer mainly consists of C and contain (A) .gtoreq.1 of B, Al, Ga, In, Tl, and As and/or (B) .gtoreq.1 of Ni oxide, Cr oxide, ferrous oxide, and MO oxide as dopants or as mixts. The **devices** are free of leak current and dark spot generation.

ST inorg hole injecting layer EL **device**; carbon hole injecting layer EL **device**; org EL **device** hole injecting layer; doped carbon hole injecting layer EL

IT Electroluminescent **devices**  
(org. EL **devices** with doped carbon or carbon-oxide **mixt.** hole-injecting layers)

IT 7429-90-5, Aluminum, uses 7440-28-0, Thallium, uses 7440-38-2, Arsenic, uses 7440-42-8, Boron, uses 7440-55-3, Gallium, uses 7440-74-6, Indium, uses  
RL: **DEV (Device component use); USES (Uses)**  
(dopant; org. EL **devices** with doped carbon or carbon-oxide **mixt.** hole-injecting layers)

IT 143010-15-5  
RL: **DEV (Device component use); USES (Uses)**  
(electron-injecting electrode; org. EL **devices** with doped carbon or carbon-oxide **mixt.** hole-injecting layers)

IT 50926-11-9, ITO  
RL: **DEV (Device component use); USES (Uses)**  
(hole-injecting electrode; org. EL **devices** with doped carbon or carbon-oxide **mixt.** hole-injecting layers)

IT 7440-44-0, Carbon, uses  
RL: **DEV (Device component use); USES (Uses)**  
(hole-injecting layer; org. EL **devices** with doped carbon or carbon-oxide **mixt.** hole-injecting layers)

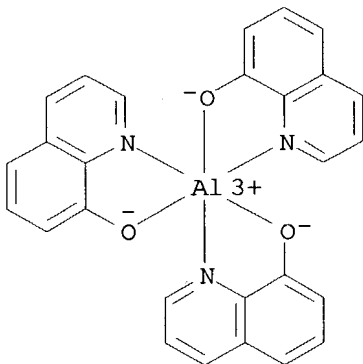
IT 1313-99-1, Nickel oxide, uses 1345-25-1, Ferrous oxide, uses 11098-99-0, Molybdenum oxide 11118-57-3, Chromium oxide  
RL: **DEV (Device component use); USES (Uses)**  
(hole-injecting layers contg.; org. EL **devices** with doped carbon or carbon-oxide **mixt.** hole-injecting layers)

IT 517-51-1, Rubrene 2085-33-8, Tris(8-quinolinolato)aluminum 169224-61-7  
RL: **DEV (Device component use); USES (Uses)**  
(**light-emitting** org. layer; org. EL **devices** with doped carbon or carbon-oxide **mixt.** hole-injecting layers)

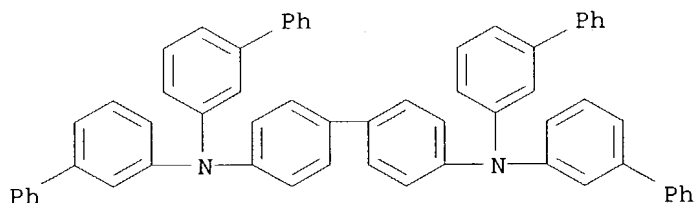
IT 2085-33-8, Tris(8-quinolinolato)aluminum 169224-61-7  
RL: **DEV (Device component use); USES (Uses)**  
(**light-emitting** org. layer; org. EL **devices** with doped carbon or carbon-oxide **mixt.** hole-injecting layers)

RN 2085-33-8 HCAPLUS

CN Aluminum, tris(8-quinolinolato-.kappa.N1,.kappa.O8)- (9CI) (CA INDEX NAME)



RN 169224-61-7 HCAPLUS  
 CN [1,1'-Biphenyl]-4,4'-diamine, N,N,N',N'-tetrakis([1,1'-biphenyl]-3-yl)-  
 (9CI) (CA INDEX NAME)



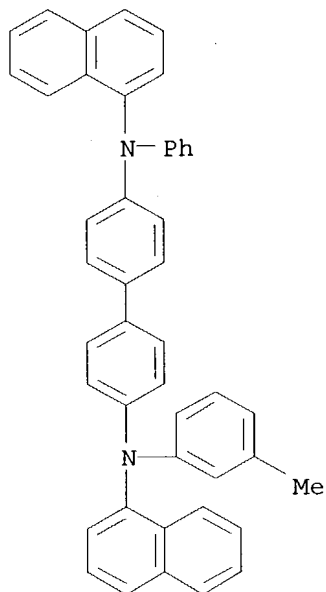
L47 ANSWER 20 OF 24 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 1997:456774 HCAPLUS  
 DN 127:57785  
 TI Organic electroluminescence device with mixed hole transporting materials  
 IN Shi, Song Q.; Gorsuch, Cynthia A.  
 PA Motorola, Inc., USA  
 SO Eur. Pat. Appl., 13 pp.  
 CODEN: EPXXDW  
 DT Patent  
 LA English  
 IC ICM H05B033-14  
 ICS H05B033-12  
 CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related  
 Properties)  
 Section cross-reference(s): 76  
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 774883	A2	19970521	EP 1996-118022	19961111
	EP 774883	A3	19970730		
	EP 774883	B1	20020724		
	R: DE, FR, GB				
	US 5804322	A	19980908	US 1995-560453	19951117
	JP 09148073	A2	19970606	JP 1996-321080	19961115
PRAI	US 1995-560453	A	19951117		
OS	MARPAT 127:57785				
AB	Org. electroluminescent devices which have a cathode, an electron				

transporting zone, an emitting zone, a hole transporting zone, and an anode that are laminated in sequence are described in which the hole transporting zone includes at least one hole transporting layer formed from .gtoreq.2 homogeneously mixed hole transporting materials each having a glass transition temp. above 75.degree..

ST org **electroluminescent** device hole transport **mixt**  
 IT Amines, uses  
 RL: DEV (Device component use); USES (Uses)  
 (arom.; org. electroluminescence device with mixed hole transporting materials)  
 IT Phosphines  
 RL: DEV (Device component use); USES (Uses)  
 (arom.; org. electroluminescent devices with mixed hole transporting materials)  
 IT Silazanes  
 RL: DEV (Device component use); USES (Uses)  
 (org. electroluminescence device with mixed hole transporting materials)  
 IT Silanes  
 RL: DEV (Device component use); USES (Uses)  
 (org. electroluminescent devices with mixed hole transporting materials)  
 IT Amines, uses  
 RL: DEV (Device component use); USES (Uses)  
 (tertiary; org. electroluminescence device with mixed hole transporting materials)  
 IT **191088-77-4**  
 RL: DEV (Device component use); USES (Uses)  
 (org. **electroluminescent** devices with mixed hole transporting materials)  
 IT **191088-77-4**  
 RL: DEV (Device component use); USES (Uses)  
 (org. **electroluminescent** devices with mixed hole transporting materials)  
 RN 191088-77-4 HCAPLUS  
 CN [1,1'-Biphenyl]-4,4'-diamine, N,N'-bis(3-methylphenyl)-N,N'-di-1-naphthalenyl-, mixt. with N,N'-di-1-naphthalenyl-N,N'-diphenyl[1,1'-biphenyl]-4,4'-diamine and N-(3-methylphenyl)-N,N'-di-1-naphthalenyl-N'-phenyl[1,1'-biphenyl]-4,4'-diamine (9CI) (CA INDEX NAME)  
 CM 1  
 CRN 191088-76-3  
 CMF C45 H34 N2

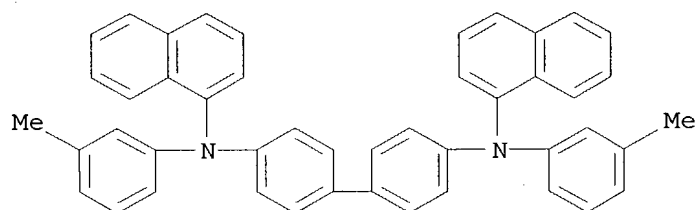




CM 2

CRN 123847-87-0

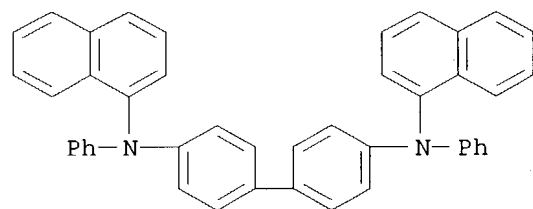
CMF C46 H36 N2



CM 3

CRN 123847-85-8

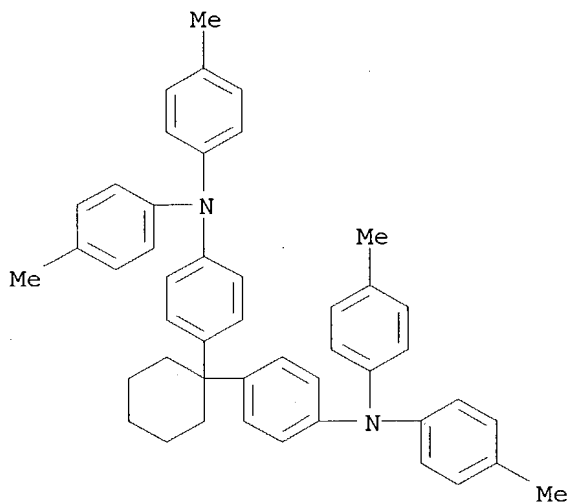
CMF C44 H32 N2



AN 1994:177811 HCAPLUS  
 DN 120:177811  
 TI Organic thin-film electroluminescent device  
 IN Nabeta, Osamu; Sugata, Yoshinobu; Kosho, Noboru  
 PA Fuji Electric Co Ltd, Japan  
 SO Jpn. Kokai Tokkyo Koho, 8 pp.  
 CODEN: JKXXAF  
 DT Patent  
 LA Japanese  
 IC ICM H05B033-14  
 ICS C09K011-06; H05B033-22  
 CC 73-12 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)  
 Section cross-reference(s): 74

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 05182762	A2	19930723	JP 1991-345746	19911227
PRAI	JP 1991-345746		19911227		
AB	The title device suited for use in flat-panel displays, comprises: an electroluminescent layer for emitting light by recombination of injected electrons and holes; a charge injection layer; and a mixed layer, disposed between the above <b>two</b> layers, contg. a <b>mixt.</b> of the luminescent material and the charge injection material.				
ST	org thin film electroluminescence device				
IT	Electroluminescent devices (org. thin-film)				
IT	<b>58473-78-2</b> RL: USES (Uses) (thin-film <b>electroluminescent</b> device contg.)				
IT	<b>58473-78-2</b> RL: USES (Uses) (thin-film <b>electroluminescent</b> device contg.)				
RN	58473-78-2 HCAPLUS				
CN	Benzenamine, 4,4'-cyclohexylidenebis[N,N-bis(4-methylphenyl)- (9CI) (CA INDEX NAME)				



L47 ANSWER 22 OF 24 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 1993:90503 HCAPLUS

DN 118:90503

TI Organic electroluminescent device

IN Sato, Yoshiharu; Saida, Atsuro

PA Mitsubishi Kasei Corp., Japan

SO Jpn. Kokai Tokkyo Koho, 8 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM C09K011-06

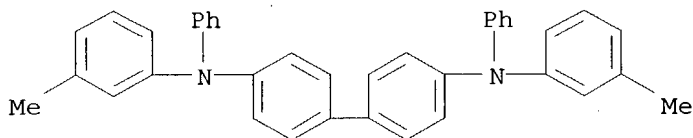
ICS H05B033-14

CC 73-12 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

Section cross-reference(s): 76

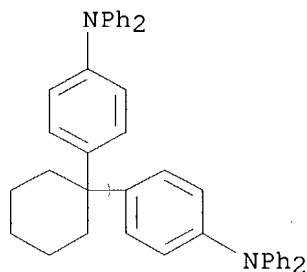
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 04161480	A2	19920604	JP 1990-287959	19901025
PRAI	JP 1990-287959		19901025		
AB	The title device, suited for use as a flat panel display or a light source, comprises an org. hole injection/transport layer and an org. luminescent layer formed between 2 electrode layers, wherein the hole injection/transport layer consists of a <b>mixt.</b> of .gtoreq. 2 arom. amines.				
ST	arom amine hole electroluminescent layer				
IT	Electroluminescent devices (film, org.)				
IT	<b>65181-78-4</b>	116942-09-7	131852-82-9	136482-43-4	137786-38-0
	<b>145024-29-9</b>				
	RL: USES (Uses) (hole injection/transport thin films from, for <b>electroluminescent</b> devices)				
IT	<b>65181-78-4 145024-29-9</b>				
	RL: USES (Uses) (hole injection/transport thin films from, for <b>electroluminescent</b> devices)				
RN	65181-78-4 HCAPLUS				
CN	[1,1'-Biphenyl]-4,4'-diamine, N,N'-bis(3-methylphenyl)-N,N'-diphenyl- (9CI) (CA INDEX NAME)				



RN 145024-29-9 HCAPLUS

CN Benzenamine, 4,4'-cyclohexylidenebis[N,N-diphenyl- (9CI) (CA INDEX NAME)



L47 ANSWER 23 OF 24 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 1991:237353 HCAPLUS

DN 114:237353

TI Electroluminescent **device**

IN Saito, Shogo; Tsutsui, Tetsuo; Adachi, Chihao

PA Ricoh Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 4 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

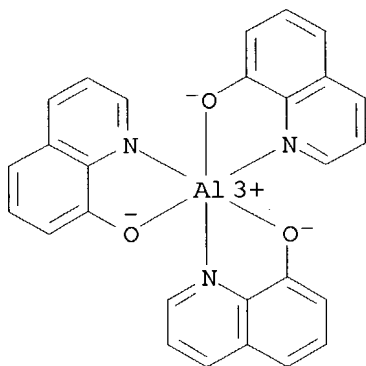
IC ICM C09K011-06

ICS H01L033-00; H05B033-14

CC 73-5 (**Optical**, Electron, and Mass Spectroscopy and Other Related Properties)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 03000790	A2	19910107	JP 1989-142656	19890605
	JP 2869447	B2	19990310		
PRAI	JP 1989-30832		19890208		
AB	The title <b>device</b> suited for use in a large-area panel light source comprises a pair of electrodes sandwiching an active film layer formed by spin-coating a soln. of a <b>mixt.</b> contg. an org. phosphor capable of transporting electrons and an electron-donor org. compd. capable of transporting pos. holes.				
ST	electroluminescent org phosphor electron donor				
IT	Electroluminescent <b>devices</b>				
	(org. phosphor and electron donor <b>mixt.</b> for)				
IT	<b>2085-33-8</b>	15570-45-3	26895-92-1		
	RL: PRP (Properties)				
	(electroluminescent phosphor, contg. electron donor org. compd.)				
IT	25067-59-8	<b>65181-78-4</b>			
	RL: PRP (Properties)				
	(electron donor, <b>electroluminescent</b> phosphor contg.)				
IT	<b>2085-33-8</b>				
	RL: PRP (Properties)				
	(electroluminescent phosphor, contg. electron donor org. compd.)				
RN	2085-33-8 HCAPLUS				
CN	Aluminum, tris(8-quinolinolato-.kappa.N1,.kappa.O8)- (9CI) (CA INDEX NAME)				

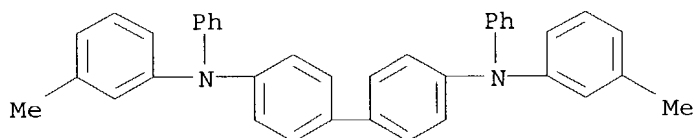


IT 65181-78-4

RL: PRP (Properties)

(electron donor, **electroluminescent** phosphor contg.)

RN 65181-78-4 HCAPLUS

CN [1,1'-Biphenyl]-4,4'-diamine, N,N'-bis(3-methylphenyl)-N,N'-diphenyl-  
(9CI) (CA INDEX NAME)

L47 ANSWER 24 OF 24 HCAPLUS COPYRIGHT 2003 ACS on STN

AN 1991:217720 HCAPLUS

DN 114:217720

TI Electroluminescent device

IN Saito, Shogo; Tsutsui, Tetsuo; Adachi, Chihaya

PA Ricoh Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 8 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

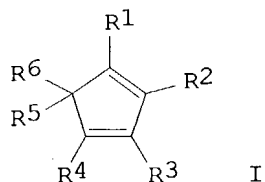
IC ICM C09K011-06

ICS H05B033-14

CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

FAN.CNT 3

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 02289675	A2	19901129	JP 1989-142652	19890605
	US 5085946	A	19920204	US 1989-457839	19891227
PRAI	JP 1989-7088		19890113		
	JP 1989-7090		19890113		
	JP 1989-42757		19890222		
	JP 1989-142652		19890605		
	JP 1989-142655		19890605		
OS	MARPAT 114:217720				
GI					



AB The title device suitable for use as a large-area surface light source comprises an active layer consisting of a thin film of a pos.-hole-transporting org. compd. and that of an electron-transporting org. phosphor or a thin film of a **mixt.** thereof and **two** electrodes sandwiching the active layer, wherein the phosphor is a cyclopentadiene deriv. I (R1-R6 = H, alkyl, halo, alkoxy, acyl, OH, aryloxy, aryl).

ST electroluminescent device cyclopentadiene deriv phosphor

IT Electroluminescent devices

(contg. cyclopentadiene derivs.)

IT 2519-10-0, 1,2,3,4,5-Pentaphenyl-1,3-cyclopentadiene 15570-45-3,

1,2,3,4-Tetraphenyl-1,3-cyclopentadiene

RL: PRP (Properties)

(phosphor, electroluminescent device contg.)

IT **65181-78-4**

RL: PRP (Properties)

(pos.-hole-transporting agent, **electroluminescent** device contg.)

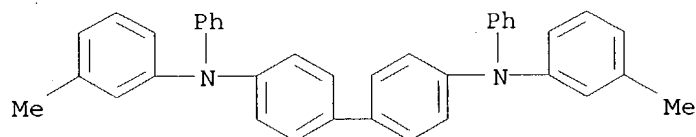
IT **65181-78-4**

RL: PRP (Properties)

(pos.-hole-transporting agent, **electroluminescent** device contg.)

RN 65181-78-4 HCAPLUS

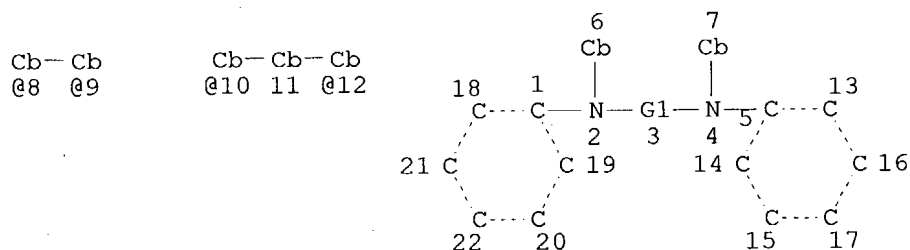
CN [1,1'-Biphenyl]-4,4'-diamine, N,N'-bis(3-methylphenyl)-N,N'-diphenyl- (9CI) (CA INDEX NAME)



=> d que

L1 SCR 1842

L2 STR



VAR G1=CB/8-2 9-4/10-2 12-4

NODE ATTRIBUTES:

DEFAULT MLEVEL IS ATOM

DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED

NUMBER OF NODES IS 22

STEREO ATTRIBUTES: NONE

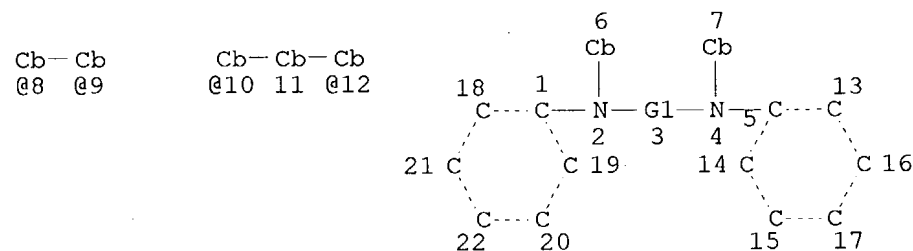
L3                      SCR 1993

L4                      SCR 1610

L5                      7412 SEA FILE=REGISTRY SSS FUL L2 AND L1 AND L3 AND L4

L6                      SCR 1842

L7                      STR



VAR G1=CB/8-2 9-4/10-2 12-4

NODE ATTRIBUTES:

DEFAULT MLEVEL IS ATOM

DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED

NUMBER OF NODES IS 22

STEREO ATTRIBUTES: NONE

L8                      SCR 1993

L9                      SCR 1610

L10 (                      7412)SEA FILE=REGISTRY SSS FUL L7 AND L6 AND L8 AND L9

L11 (                      5810)SEA FILE=HCAPLUS ABB=ON L10

L12 (                      2145)SEA FILE=HCAPLUS ABB=ON L11(L)ELECTROLUMINES?

L13 (                      2)SEA FILE=HCAPLUS ABB=ON L12(L)MIXTURE?

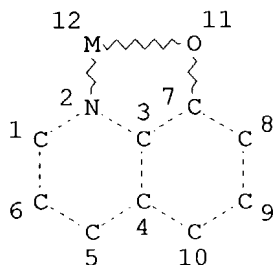
L14 (                      7)SEA FILE=HCAPLUS ABB=ON L12 AND MIXTURE?(4A) (EL OR ELECTROLUMI  
 NES? OR LIGHT?(3A)?EMIT?)

L15 (                      9)SEA FILE=HCAPLUS ABB=ON L12 AND MIXTURE?(4A) (2 OR TWO)

L16 (                      2927)SEA FILE=HCAPLUS ABB=ON L11(L) (EL OR ?LUMINES? OR LIGHT?(3A)?E

MIT?)

L17 ( 10) SEA FILE=HCAPLUS ABB=ON L16 AND MIXTURE?(4A) (2 OR TWO)  
 L18 ( 12) SEA FILE=HCAPLUS ABB=ON L16 AND MIXTURE?(4A) (EL OR ELECTROLUMI  
 NES? OR LIGHT?(3A)?EMIT?)  
 L19 19 SEA FILE=HCAPLUS ABB=ON L13 OR L14 OR L15 OR L17 OR L18  
 L20 STR



NODE ATTRIBUTES:  
 DEFAULT MLEVEL IS ATOM  
 DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:  
 RING(S) ARE ISOLATED OR EMBEDDED  
 NUMBER OF NODES IS 12

STEREO ATTRIBUTES: NONE

L24 31942 SEA FILE=REGISTRY ABB=ON 16.536.5/RID  
 L27 44435 SEA FILE=REGISTRY ABB=ON 16.239.9/RID  
 L28 8270 SEA FILE=REGISTRY SSS FUL L20  
 L29 7427 SEA FILE=REGISTRY ABB=ON L24 AND 4/NR  
 L30 6339 SEA FILE=REGISTRY ABB=ON L27 AND 5/NR  
 L31 5810 SEA FILE=HCAPLUS ABB=ON L5  
 L32 7799 SEA FILE=HCAPLUS ABB=ON L28  
 L33 2526 SEA FILE=HCAPLUS ABB=ON L29  
 L34 2604 SEA FILE=HCAPLUS ABB=ON L30  
 L35 2485 SEA FILE=HCAPLUS ABB=ON L31 AND (L32 OR L33 OR L34)  
 L36 2927 SEA FILE=HCAPLUS ABB=ON L5 (L) (EL OR ?LUMINES? OR LIGHT?(3A)?EM  
 IT?)  
 L37 2119 SEA FILE=HCAPLUS ABB=ON L35 AND L36  
 L38 60 SEA FILE=HCAPLUS ABB=ON L37 AND MIXTURE?  
 L39 59 SEA FILE=HCAPLUS ABB=ON L38 AND OPTICAL?/SC,SX  
 L40 59 SEA FILE=HCAPLUS ABB=ON L39 AND (DEVICE? OR DEV/RL)  
 L41 130539 SEA FILE=HCAPLUS ABB=ON MIXTURE?/IT  
 L42 10 SEA FILE=HCAPLUS ABB=ON L40 AND L41  
 L43 41 SEA FILE=HCAPLUS ABB=ON L38 AND ELECTRIC?/SC,SX  
 L44 41 SEA FILE=HCAPLUS ABB=ON L43 AND (DEVICE? OR DEV/RL)  
 L45 8 SEA FILE=HCAPLUS ABB=ON L41 AND L44  
 L46 10 SEA FILE=HCAPLUS ABB=ON L42 OR L45  
 L47 24 SEA FILE=HCAPLUS ABB=ON L19 OR L46  
 L48 892 SEA FILE=HCAPLUS ABB=ON L28 (L) LIGHT?(L)?EMIT?  
 L49 157 SEA FILE=HCAPLUS ABB=ON L33 (L) LIGHT?(L)?EMIT?  
 L50 8 SEA FILE=HCAPLUS ABB=ON L34 (L) LIGHT?(L)?EMIT?  
 L51 605 SEA FILE=HCAPLUS ABB=ON (L48 OR L49 OR L50) AND L36  
 L52 7 SEA FILE=HCAPLUS ABB=ON L41 AND L51  
 L53 30 SEA FILE=HCAPLUS ABB=ON L51 AND MIXTURE?  
 L54 24 SEA FILE=HCAPLUS ABB=ON L52 OR L47  
 L55 22 SEA FILE=HCAPLUS ABB=ON (L53 OR L54) NOT L47  
 L59 4 SEA FILE=HCAPLUS ABB=ON L55 AND (SPECTRUM OR PEAK#)



=&gt; d 159 all 1-4 hitstr

L59 ANSWER 1 OF 4 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2002:928080 HCAPLUS  
 DN 138:17951  
 TI Organometallic compounds and emission-shifting organic electrophosphorescence  
 IN Lamansky, Sergey; Thompson, Mark E.; Adamovich, Vadim; Djurovich, Peter I.; Adachi, Chihaya; Baldo, Marc A.; Forrest, Stephen R.; Kwong, Raymond  
 PA Trustee of Princeton University, USA  
 SO U.S. Pat. Appl. Publ., 87 pp., Cont.-in-part of U.S. Ser. No. 637,766.  
 CODEN: USXXCO  
 DT Patent  
 LA English  
 IC ICM H05B033-14  
 ICS C09K011-06  
 NCL 428690000; 428917000; 313504000; 313506000; 257102000; 257103000; 252301160; 544225000; 546002000; 548101000  
 CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)  
 Section cross-reference(s): 76, 78

FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2002182441	A1	20021205	US 2001-978455	20011016
PRAI	US 2000-637766	A2	20000811		
	US 2001-283814P	P	20010413		

AB Org. light-emitting devices including an emissive layer comprising an organometallic compd. are described in which the organometallic compd. comprises a heavy transition metal (e.g., Os, Ir, Pt, or Au) that produces an efficient phosphorescent emission at room temp. from a **mixt.** of metal-to-ligand charge transfer and .pi.-.pi.\* ligand states; .gtoreq.1 mono-anionic bidentate carbon-coordination ligand bound to the heavy transition metal, the ligand(s) being substituted with an electron-donating substituent and/or an electron-withdrawing substituent which shifts the emission, relative to the unsubstituted ligand, to either the blue, green, or red region of the visible **spectrum**; and .gtoreq.1 non-monoanionic bidentate carbon-coordination ligand bound to the heavy transition metal which ligand(s) causes the emission to have a well defined vibronic structure. The organometallic compds. are also claimed.

ST org light emitting device emission shifting organometallic complex  
 IT Luminescent substances

Phosphorescent substances

(org. light-emitting devices using emission shifting organometallic complexes and the complexes)

IT Electroluminescent devices

(org.; org. light-emitting devices using emission shifting organometallic complexes and the complexes)

IT 147-14-8, Copper phthalocyanine **2085-33-8**, Tris(8-hydroxyquinolino)aluminum 4733-39-5, Bathocuproine 31248-39-2  
 50926-11-9, Indium tin oxide 58328-31-7, 4,4'-N,N'-Dicarbazolylbiphenyl  
**65181-78-4**, TPD 94928-86-6, fac-Tris(2-phenylpyridine)iridium  
**123847-85-8**, 4,4'-Bis[N-(1-naphthyl)-N-phenylamino]biphenyl  
**146162-54-1**

RL: DEV (Device component use); USES (Uses)

(org. **light-emitting** devices using emission shifting organometallic complexes and the complexes)

IT 40243-13-8P 345659-08-7P 376367-93-0P 376367-95-2P 391665-84-2P  
 400653-85-2P 400653-86-3P 400653-87-4P 400653-88-5P 400653-89-6P  
 400653-90-9P 400653-91-0P 400653-92-1P 400653-93-2P 400653-94-3P  
 400653-95-4P 400653-96-5P 400653-97-6P 400653-98-7P 400654-01-5P  
 400654-02-6P 400654-04-8P 400654-05-9P 400654-06-0P 400654-08-2P  
 400654-10-6P 400654-12-8P 400654-13-9P

RL: DEV (Device component use); MOA (Modifier or additive use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)

(org. light-emitting devices using emission shifting organometallic complexes and the complexes)

IT 88821-71-0 125051-45-8 400654-15-1 400655-42-7

RL: PRP (Properties)

(org. light-emitting devices using emission shifting organometallic complexes and the complexes)

IT 56-40-6, Glycine, reactions 98-97-5, Pyrazinecarboxylic acid 98-98-6, Picolinic acid 109-04-6, 2-Bromopyridine 110-86-1, Pyridine, reactions 123-54-6, 2,4-Pentadione, reactions 151-50-8, Potassium cyanide 366-18-7, 2,2'-Bipyridine 540-72-7, Sodium thiocyanide 603-35-0, Triphenylphosphine, reactions 939-23-1, 4-Phenylpyridine 1663-45-2, 1,2-Bis(diphenylphosphino)ethane 7188-38-7, tert-Butylisocyanide 10025-83-9, Iridium trichloride 15635-87-7, Iridium tris(acetylacetonate) 18583-60-3, Potassium tris(pyrazolyl)borate 40243-18-3 99646-28-3 125081-56-3 144025-03-6, 2,4-Difluorophenylboronic acid 155475-93-7 158333-96-1 400653-99-8 400654-03-7 400654-07-1 400654-09-3 400654-11-7 400654-14-0

RL: RCT (Reactant); RACT (Reactant or reagent)

(org. light-emitting devices using emission shifting organometallic complexes and the complexes)

IT 391604-55-0P 391611-77-1P 400654-00-4P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(org. light-emitting devices using emission shifting organometallic complexes and the complexes)

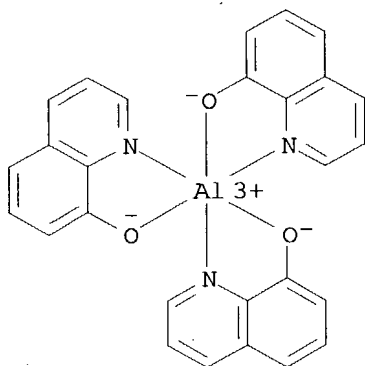
IT 2085-33-8, Tris(8-hydroxyquinolinato)aluminum 65181-78-4, TPD 123847-85-8, 4,4'-Bis[N-(1-naphthyl)-N-phenylamino]biphenyl 146162-54-1

RL: DEV (Device component use); USES (Uses)

(org. **light-emitting** devices using emission shifting organometallic complexes and the complexes)

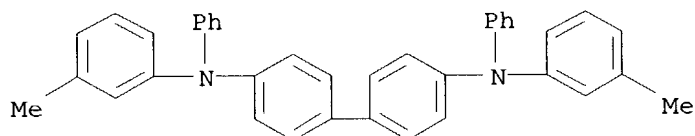
RN 2085-33-8 HCAPLUS

CN Aluminum, tris(8-quinolinolato-.kappa.N1,.kappa.O8)- (9CI) (CA INDEX NAME)



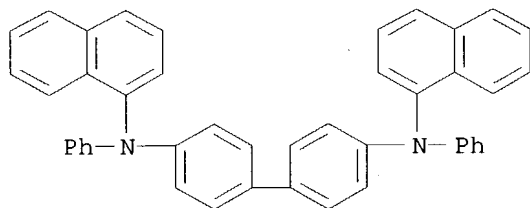
RN 65181-78-4 HCAPLUS

CN [1,1'-Biphenyl]-4,4'-diamine, N,N'-bis(3-methylphenyl)-N,N'-diphenyl-  
(9CI) (CA INDEX NAME)



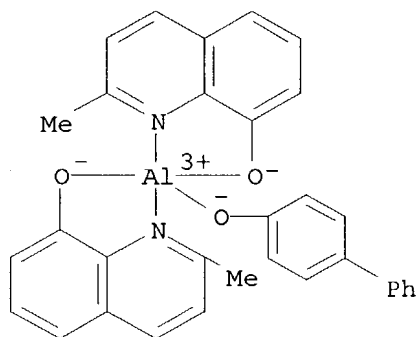
RN 123847-85-8 HCAPLUS

CN [1,1'-Biphenyl]-4,4'-diamine, N,N'-di-1-naphthalenyl-N,N'-diphenyl- (9CI)  
(CA INDEX NAME)



RN 146162-54-1 HCAPLUS

CN Aluminum, ([1,1'-biphenyl]-4-olato)bis(2-methyl-8-quinolinolato-  
.kappa.N1,.kappa.O8)- (9CI) (CA INDEX NAME)



L59 ANSWER 2 OF 4 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2002:143099 HCAPLUS  
 DN 136:191506  
 TI Organometallic compounds and emission-shifting organic electrophosphorescence  
 IN Lamansky, Sergey; Thompson, Mark E.; Adamovich, Vadim; Djurovich, Peter L.; Adachi, Chihaya; Baldo, Marc A.; Forrest, Stephen R.; Kwong, Raymond C.  
 PA The Trustees of Princeton University, USA; The University of Southern California; Universal Display Corporation  
 SO PCT Int. Appl., 155 pp.  
 CODEN: PIXXD2  
 DT Patent  
 LA English  
 IC ICM H05B033-14  
 ICS C09K011-06; C07D213-02; C07D231-10; C07D241-10; C07D333-52  
 CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)  
 Section cross-reference(s): 76, 78

FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2002015645	A1	20020221	WO 2001-US25108	20010810
	W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
	AU 2001083274	A5	20020225	AU 2001-83274	20010810
	EP 1325671	A1	20030709	EP 2001-962061	20010810
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
PRAI	US 2000-637766	A	20000811		
	US 2001-283814P	P	20010413		
	WO 2001-US25108	W	20010810		
AB	Org. light-emitting devices including an emissive layer comprising an organometallic compd. are described in which the organometallic compd. comprises a heavy transition metal (e.g., Os, Ir, Pt, or Au) that produces				

an efficient phosphorescent emission at room temp. from a **mixt.** of metal-to-ligand charge transfer and  $\pi-\pi^*$  ligand states; .gtoreq.1 mono-anionic bidentate carbon-coordination ligand bound to the heavy transition metal, the ligand(s) being substituted with an electron-donating substituent and/or an electron-withdrawing substituent which shifts the emission, relative to the unsubstituted ligand, to either the blue, green, or red region of the visible **spectrum**; and .gtoreq.1 non-monoanionic bidentate carbon-coordination ligand bound to the heavy transition metal which ligand(s) causes the emission to have a well defined vibronic structure. The organometallic compds. are also claimed.

ST org light emitting device emission shifting organometallic complex  
IT Luminescent substances

Phosphorescent substances

(org. light-emitting devices using emission shifting organometallic complexes and the complexes)

IT Electroluminescent devices

(org.; org. light-emitting devices using emission shifting organometallic complexes and the complexes)

IT 147-14-8, Copper phthalocyanine **2085-33-8**, Tris(8-hydroxyquinolinato)aluminum 4733-39-5, Bathocuproine 31248-39-2  
50926-11-9, Indium tin oxide 58328-31-7, 4,4'-N,N'-Dicarbazolylbiphenyl **65181-78-4**, TPD 94928-86-6, fac-Tris(2-phenylpyridine)iridium **123847-85-8**, 4,4'-Bis[N-(1-naphthyl)-N-phenylamino]biphenyl **146162-54-1**

RL: DEV (Device component use); USES (Uses)

(org. **light-emitting** devices using emission shifting organometallic complexes and the complexes)

IT 40243-13-8P 345659-08-7P 376367-93-0P 376367-95-2P 391665-84-2P  
400653-85-2P 400653-86-3P 400653-87-4P 400653-88-5P 400653-89-6P  
400653-90-9P 400653-91-0P 400653-92-1P 400653-93-2P 400653-94-3P  
400653-95-4P 400653-96-5P 400653-97-6P 400653-98-7P 400654-01-5P  
400654-02-6P 400654-04-8P 400654-05-9P 400654-06-0P 400654-08-2P  
400654-10-6P 400654-12-8P 400654-13-9P

RL: DEV (Device component use); MOA (Modifier or additive use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)

(org. light-emitting devices using emission shifting organometallic complexes and the complexes)

IT 88821-71-0 125051-45-8 400654-15-1 400655-42-7

RL: PRP (Properties)

(org. light-emitting devices using emission shifting organometallic complexes and the complexes)

IT 56-40-6, Glycine, reactions 98-97-5, Pyrazinecarboxylic acid 98-98-6, Picolinic acid 109-04-6, 2-Bromopyridine 110-86-1, Pyridine, reactions 123-54-6, 2,4-Pentadione, reactions 151-50-8, Potassium cyanide 366-18-7, 2,2'-Bipyridine 540-72-7, Sodium thiocyanide 603-35-0, Triphenylphosphine, reactions 939-23-1, 4-Phenylpyridine 1663-45-2, 1,2-Bis(diphenylphosphino)ethane 7188-38-7, tert-Butylisocyanide 10025-83-9, Iridium trichloride 15635-87-7, Iridium tris(acetylacetonate) 18583-60-3, Potassium tris(pyrazolyl)borate 40243-18-3 99646-28-3 125081-56-3 144025-03-6, 2,4-Difluorophenylboronic acid 155475-93-7 158333-96-1 400653-99-8 400654-03-7 400654-07-1 400654-09-3 400654-11-7 400654-14-0

RL: RCT (Reactant); RACT (Reactant or reagent)

(org. light-emitting devices using emission shifting organometallic complexes and the complexes)

IT 391604-55-0P 391611-77-1P 400654-00-4P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT

(Reactant or reagent)

(org. light-emitting devices using emission shifting organometallic complexes and the complexes)

RE.CNT 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

(1) Baldo; Applied Physics Letters 1999, V75(1), P4 HCAPLUS

(2) Baldo; Nature 1998, V395, P151 HCAPLUS

(3) Baldo; Nature 2000, V403, P750 HCAPLUS

(4) Von Zelewsky; Coordination Chemistry Reviews 1994, V132, P75 HCAPLUS

IT 2085-33-8, Tris(8-hydroxyquinolino)aluminum 65181-78-4

, TPD 123847-85-8, 4,4'-Bis[N-(1-naphthyl)-N-phenylamino]biphenyl 146162-54-1

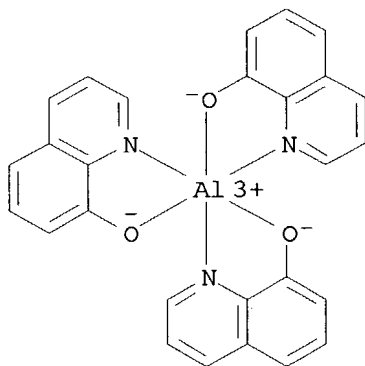
RL: DEV (Device component use); USES (Uses)

(org. light-emitting devices using emission

shifting organometallic complexes and the complexes)

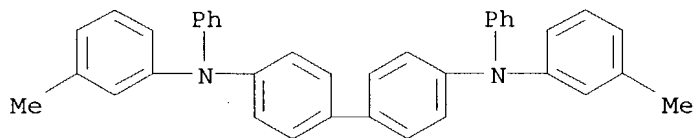
RN 2085-33-8 HCAPLUS

CN Aluminum, tris(8-quinolinolato-.kappa.N1,.kappa.O8)- (9CI) (CA INDEX NAME)



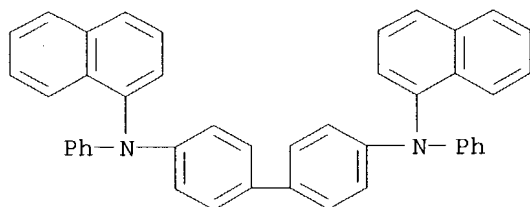
RN 65181-78-4 HCAPLUS

CN [1,1'-Biphenyl]-4,4'-diamine, N,N'-bis(3-methylphenyl)-N,N'-diphenyl- (9CI) (CA INDEX NAME)

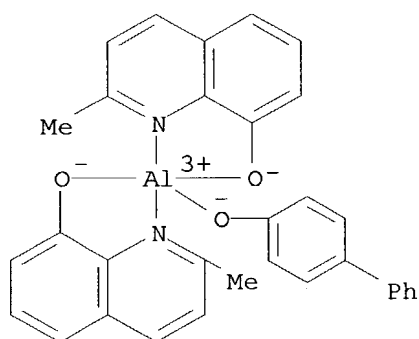


RN 123847-85-8 HCAPLUS

CN [1,1'-Biphenyl]-4,4'-diamine, N,N'-di-1-naphthalenyl-N,N'-diphenyl- (9CI) (CA INDEX NAME)



RN 146162-54-1 HCAPLUS  
 CN Aluminum, ([1,1'-biphenyl]-4-olato)bis(2-methyl-8-quinolinolato-  
 .kappa.N1,.kappa.O8)- (9CI) (CA INDEX NAME)



L59 ANSWER 3 OF 4 HCAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2000:682597 HCAPLUS  
 DN 134:10925  
 TI Lithium-Quinolate Complexes as Emitter and Interface Materials in Organic  
 Light-Emitting Diodes  
 AU Schmitz, Christoph; Schmidt, Hans-Werner; Thelakkat, Mukundan  
 CS Lehrstuhl fuer Makromolekulare Chemie I und Bayreuther Institut fuer  
 Makromolekuel Forschung, University of Bayreuth, Bayreuth, 95440, Germany  
 SO Chemistry of Materials (2000), 12(10), 3012-3019  
 CODEN: CMATEX; ISSN: 0897-4756  
 PB American Chemical Society  
 DT Journal  
 LA English  
 CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related  
 Properties)  
 Section cross-reference(s): 22, 29, 76  
 AB The authors synthesized lithium-quinolate complexes, 8-  
 hydroxyquinolinolatolithium (LiQ) and 2-methyl-8-  
 hydroxyquinolinolatolithium (LiMeQ), as emitter and electron  
 injection/transport materials to be used in conventional two-layer org.  
 light-emitting diodes in combination with N,N'-bis(p-methoxyphenyl)-N,N'-  
 diphenylbenzidine (DMeOTPD) as hole transport material (HTL). The lithium  
 complexes were also examd. as interface materials in combination with  
 8-hydroxyquinolinolato-Al(III) (Alq3) as emitter material. The device  
 efficiency with these complexes was optimized by combinatorial methods.  
 The electron injection, transport, and emission properties of Li complexes  
 were compared with the well-known emitter Alq3 in the same expt. by taking  
 advantage of the combinatorial approach. The Li quinolates are found to

be efficient emitter mols. But the efficiencies of lithium quinolate devices are lower than that of Alq3 devices. Contrary to the Alq3 emission, the Li quinolates exhibit a bathochromic shift of emission compared to the resp. photoluminescence spectra. No clear evidence of exciplex formation was seen by comparing the photoluminescence **spectrum** of an equimolar **mixt.** of Li quinolate and DMeOTPD with the obsd. electroluminescence **spectrum**. However, the lithium complexes increase the efficiency of an optimized indium-tin oxide (ITO)/DMeOTPD/Alq3/Al device considerably when used as a thin interface layer between Alq3 and aluminum. The improvement of device characteristics with lithium quinolates is similar to that obtained with LiF salt.

ST lithium quinolate complex emitter interface org light emitting diode; LED  
luminescence electro lithium quinolate complex  
IT UV absorption  
(UV-visible; of lithium-quinolate complexes, tris(8-hydroxyquinolinato)aluminum and DMeOTPD)  
IT Luminescence  
Luminescence, electroluminescence  
(lithium-quinolate complexes as emitter and interface materials in org. light-emitting diodes)  
IT Fluorescence  
HOMO (molecular orbital)  
LUMO (molecular orbital)  
Thermal stability  
(of lithium-quinolate complexes, tris(8-hydroxyquinolinato)aluminum and DMeOTPD)  
IT Electroluminescent devices  
(two-layer org.; lithium-quinolate complexes as emitter and interface materials in org. light-emitting diodes)  
IT 148-24-3, 8-Hydroxyquinoline, reactions 826-81-3, 2-Methyl-8-hydroxyquinoline 1310-65-2, Lithium hydroxide  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(LED with lithium-quinolate complexes prepd. using)  
IT 2085-33-8, Alq3  
RL: DEV (Device component use); USES (Uses)  
(as **emitter** material; lithium-quinolate complexes as **emitter** and interface materials in org. **light-emitting** diodes)  
IT 20441-07-0  
RL: DEV (Device component use); USES (Uses)  
(as hole transport material; lithium-quinolate complexes as emitter and interface materials in org. **light-emitting** diodes)  
IT 25387-93-3P, Lithium, (8-quinolinolato)- 160883-74-9P  
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PNU (Preparation, unclassified); PRP (Properties); PREP (Preparation); PROC (Process); USES (Uses)  
(lithium-quinolate complexes as emitter and interface materials in org. light-emitting diodes)

RE.CNT 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD

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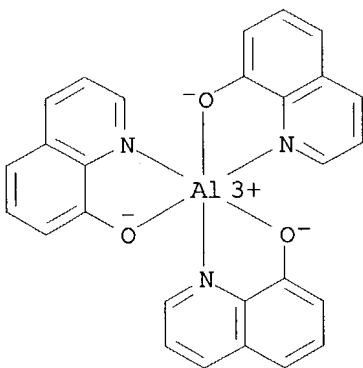
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- (14) Schmitz, C; Phys Chem Chem Phys 1999, V1, P1777 HCAPLUS
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IT 2085-33-8, Alq3

RL: DEV (Device component use); USES (Uses)  
 (as **emitter** material; lithium-quinolate complexes as  
**emitter** and interface materials in org. **light-**  
**emitting** diodes)

RN 2085-33-8 HCAPLUS

CN Aluminum, tris(8-quinolinolato-.kappa.N1,.kappa.O8)- (9CI) (CA INDEX NAME)

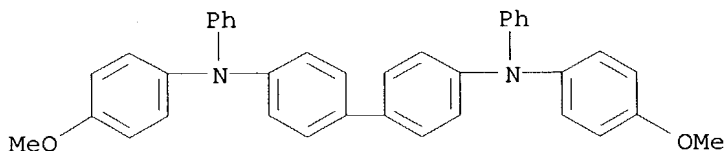


IT 20441-07-0

RL: DEV (Device component use); USES (Uses)  
 (as hole transport material; lithium-quinolate complexes as emitter and  
 interface materials in org. **light-emitting** diodes)

RN 20441-07-0 HCAPLUS

CN [1,1'-Biphenyl]-4,4'-diamine, N,N'-bis(4-methoxyphenyl)-N,N'-diphenyl-  
 (9CI) (CA INDEX NAME)



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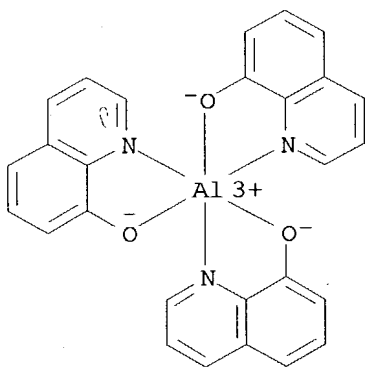
AN 1995:139652 HCAPLUS

DN 122:118733

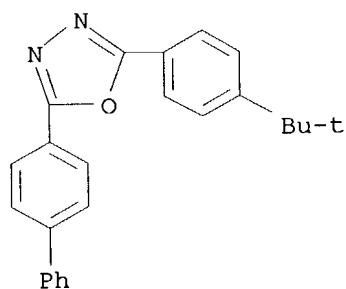
TI Bright red light-emitting organic electroluminescent devices having a  
 europium complex as an emitter

AU Kido, Junji; Hayase, Hiromichi; Hongawa, Kenichi; Nagai, Katsutoshi;

Okuyama, Katsuro  
 CS Dep. Materials Science Engineering, Yamagata Univ., Yamagata, 992, Japan  
 SO Applied Physics Letters (1994), 65(17), 2124-6  
 CODEN: APPLAB; ISSN: 0003-6951  
 DT Journal  
 LA English  
 CC 74-9 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)  
 AB Org. electroluminescent (EL) devices with a trivalent europium (Eu) complex as an emitter were fabricated. Triple-layer cell comprised glass substrate/indium-tin oxide/triphenyldiamine deriv. contg. hole-transport layer/emitter center from 1:3 **mixt.** of tris(1,3-diphenyl-1,3-propanediono)(monophenanthroline)europium and 1,3,4-oxadiazole deriv. /electron-injecting layer of tris(8-quinolinato)aluminum complex /Mg:Ag electron-injecting cover. The cell exhibited bright red luminescence upon applying d.c. voltage. The electroluminescence **spectrum** consisted of extremely sharp emission bands, which was a typical luminescence **spectrum** of the Eu complex. Luminance of 460 cd/m<sup>2</sup> with an emission **peak** at 614 nm was achieved at a drive voltage of 16 V. This was the highest luminance so far obtained for the EL cells having a Eu complex as an emitter.  
 ST electroluminescent display device europium complex emitter  
 IT Electroluminescent devices  
 Luminescence, electro-  
 (bright red light-emitting org. electroluminescent display device contg. europium complex as emitter center)  
 IT **2085-33-8 15082-28-7** 17904-83-5, Tris(1,3-diphenyl-1,3-propanedionato)(phenanthroline)europium 37271-44-6 **65181-78-4**, N,N'-Diphenyl-N,N'-bis-(3-methylphenyl)-1,1'-biphenyl-4,4'-diamine  
 RL: DEV (Device component use); PRP (Properties); USES (Uses)  
 (bright red **light-emitting** org.  
**electroluminescent** display device contg. europium complex as **emitter** center)  
 IT **2085-33-8 15082-28-7 65181-78-4**, N,N'-Diphenyl-N,N'-bis-(3-methylphenyl)-1,1'-biphenyl-4,4'-diamine  
 RL: DEV (Device component use); PRP (Properties); USES (Uses)  
 (bright red **light-emitting** org.  
**electroluminescent** display device contg. europium complex as **emitter** center)  
 RN 2085-33-8 HCAPLUS  
 CN Aluminum, tris(8-quinolinolato-.kappa.N1,.kappa.O8)- (9CI) (CA INDEX NAME)



RN 15082-28-7 HCAPLUS  
CN 1,3,4-Oxadiazole, 2-[1,1'-biphenyl]-4-yl-5-[4-(1,1-dimethylethyl)phenyl]-  
(9CI) (CA INDEX NAME)



RN 65181-78-4 HCAPLUS  
CN [1,1'-Biphenyl]-4,4'-diamine, N,N'-bis(3-methylphenyl)-N,N'-diphenyl-  
(9CI) (CA INDEX NAME)

